

## DOCTOR OF PHILOSOPHY

### An analysis of the adoption and use of HRIS in the public Universities in Saudi Arabia

Aletaibi, Rashid Ghazi

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# An analysis of the adoption and use of HRIS in the public Universities in Saudi Arabia

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# **An analysis of the adoption and use of HRIS in the public Universities in Saudi Arabia**

**BY**

**RASHID GHAZI ALETAIBI**

**Award PhD**

**August 2016**



***A thesis submitted in partial fulfilment of the University's  
requirements for the Degree of Doctor of Philosophy***

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**Coventry University**

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## **Abstract**

Evaluating the use of human resource information systems (HRIS) by employees working in the human resource management (HRM) departments of the public universities in Saudi Arabia is one of the main aims of this project. Other researchers in this field have proposed several success models for HRIS use, and they are suitable for organisations working in the conditions and circumstances surrounding a particular region; however, they cannot be applied directly to Saudi organisations. Thus, it is very important to construct an HRIS use model for higher education institutions. In view of the weaknesses of other HRIS success models for the particular environment in Saudi Arabia, this study has integrated some incumbent factors into the DeLone and McLean HRIS success model to develop a new model that provides comprehensive insight into the most important factors affecting the issue of HRIS within the HR Departments of Saudi universities.

This results in the development of a theoretical framework as a model to carry out the investigation into the impacts of various dimensions of the proposed model on the use of HRIS by employees. A mixed-method research design involving interviews and questionnaires was used to collect qualitative and quantitative data; analytical techniques along with SPSS20 were employed to analyse the data. The results obtained from the qualitative phase showed that there were six factors that affected the use of HRIS in the HR Departments of public universities: usefulness, a speedier decision-making process, system quality, ease of use, subjective norms (social and peer pressures), and the unification of systems. The impact of these dimensions on the use of HRIS was measured in the qualitative phase, showing the positive impact of system quality, service quality, and ease of use on the use of a system.

Furthermore, the impact of HRIS on human resources (HR), based on performance and productivity, was investigated through interviews and surveys with the sample population. In general, it was found that HRIS have a significant and positive impact on the performance and productivity of the HR Departments of public universities in Saudi Arabia. This study's main contribution is the successful development of an adoption model for the measurement of HRIS use in Saudi public universities, by taking into account the social elements that play an important role in the use of HRIS in Saudi Arabia. This is the first study of its kind that has been performed to measure the factors and map the strength of their relationship with the use of HRIS, user satisfaction and HRIS adoption.

## **DECLARATION**

I Rashid Ghazi Aletaibi declare that this research and the ideas, analysis, findings and conclusions that are included in this PhD dissertation were developed entirely by me for the purpose of this programme only, and have not been submitted for another qualification.

## **DEDICATION**

This thesis is dedicated, with deepest love and everlasting respect, to my parents.

Without your prayers, support and encouragement, I could not have reached this stage. It is also dedicated to my wife Nagah Alotaibi for her patience and support throughout the period of my research and to my loving kids (Tariq, Ghadah, Raghad Ghaida and Omar) for their patience while being away from me. Their sweetest memories keep me working hard.



## **Acknowledgments**

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Many thanks are also due to all the heads and managers of HR Departments and the respondents in the five public universities in Saudi Arabia for their valuable time, support, and willingness to provide information on their HRM practices during my field trips.

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## LIST OF ABBREVIATIONS

ABBREVIATIONS	THE TERM
D&M	DELONE AND MCLEN
ERP	ENTERPRISE RESOURCE PLANNING
HAU	HAIL UNIVERSITY
HE	HIGHER EDUCATION
HR	HUMAN RESOURCE
HRIS	HUMAN RESORCE INFORMATION SYSTEMS
HRM	HUMAN RESOURCE MANAGEMENT
IQ	INFORMATION QUALITY
IS	INFORMATION SYSTEM
IT	INFORMATION TECHNOLOGY
JOU	JOUF UNIVERSITY
KSA	KINGDOM OF SAUDI ARABIA
MENA	MIDDLE EAST AND NORTH AFRICA
MIS	MANAGEMENT INFFORMATION SYSTEM
NBU	NORTHERN BORDERS UNIVERSITY
ONB	ORGANISATION HRIS ADOPTION
QAU	QASSIM UNIVERSITY
QS	SYSTEM QUALITY
SHU	SHQRA UNIVERSITY
SN	SUBJECTIVE NORM
SQ	SERVICE QUALITY
SU	SYSTEM USE
TAM	TECHNOLOGY ACCEPTENCE MODEL
UAI	UNCERTAINTY AVOIDANCE INDEX
URS	USER SATISFACTION
UTAUT	UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY

## CHAPTER 1: INTRODUCTION

### 1.0 Overview

This chapter presents the introduction of the research problem and the rationale for conducting this research. It highlights and justifies the motivation of the research; this includes the aims, objectives and significance of the study. This chapter also provides an overview of the rest of the research chapters, which is divided into seven chapters. Firstly, the background of the research location is presented (The Kingdom of Saudi Arabia) to provide an insight into the study. Secondly, the description of the research background is presented to introduce the research problems. Thirdly, the research problem is described in detail in order to provide a better understanding of the purpose of the research. Fourthly, the research question is presented, including the aims of the study and the research objectives. Fifthly, a detailed description of the significance of the study is presented. Sixthly, the conceptual definition of the human resources information system is presented, in order to provide in-depth knowledge of its deployment in organisations and other institutes.

The next section provides an insight into the research location of the study.

### 1.1 Background of the Research Location – The Kingdom of Saudi Arabia

The Kingdom of Saudi Arabia (KSA) is located in the southwest corner of Asia and it is at the crossroads of Europe, Asia and Africa. Saudi Arabia covers an area of approximately 2,240,000 square kilometres (Central Department of Statistics & Information 2013). It is surrounded by the Red Sea in the West, by Yemen and Oman in the South, by the Arabian Gulf, the United Arab Emirates and Qatar in the East, and by Jordan, Iraq and Kuwait in the North. The population of Saudi Arabia is approximately thirty million, of which six million people are non-Saudi, according to data from 2013 (Central Department of Statistics and Information 2013, Achoui 2009). The KSA is naturally enriched with oil, which has led to a huge increase in oil activities and its derivatives, and has impacted positively on the economy. It is the largest oil producer and exporter in the world, and is one of the 20th largest economies on the globe (Achoui 2009).

Also, Saudi Arabia is the centre of the Islamic world, and two of its holy cities, Makkah and Madderah, are mainly used to host Muslim faithfuls from around the world

annually, thus increasing different economic activities such as tourism. The Islamic foundation is not only about people's daily lives but it also provides laws, administrations, and international and domestic policies (Saudi Ministry of Foreign Affairs 2009). Today, Saudi Arabia "represents a unique country and convergent blend of social conservatism and technological prowess, a tremendous transformation from an isolated, desert land that it was over 50 years ago" (Sait, Altawil, and Hussain 2004: 1).

In order to compete with the world, the country has demonstrated that it will keep up with global development, scientific and technological progression, and human empowerment (Alamri 2011). This has led the government to embark on different skills training and higher education training programmes. An example of this is the fact that the government has sponsored tens of thousands of Saudi students over the last six years, in order for them to study in western developed countries. The country believes that this is a positive omen and that it will impact positively in various fields in the country (Saudi Ministry of Higher Education 2009a). The interdisciplinary scholarships provided by the government include studies in medical sciences, engineering, information technology, natural sciences (biology, chemistry, physics and mathematics), law, and business. Among the business fields, e-commerce is considered to be one of the most important needs for the development of the Saudi Arabian economy, and information technology (IT) will be a key part of this development (Saudi Ministry of Higher Education 2009b).

The Ministry of Labour in Saudi Arabia has recently started a *Saudisation Project* (replacing foreign labour with Saudi nationals, especially in the private sectors). The ministry has also increased the percentage of females employed in Saudi Arabia. However, the government has been trying to resolve the issue of cultural and social traditional differences among employees, which has also affected the rate of female employment (equal employment rights).

All the factors mentioned above have really affected companies as they try to provide solutions to equality issues, balancing numbers of foreign workers, etc. It has been suggested that providing IT systems in HRs may provide a better solution for addressing many issues (Al Gahtani 2003). This will provide an opportunity to monitor different factors such as current numbers in the workforce (male and female, foreign workers

etc.) for decision-making purposes. The next section will therefore provide a detailed introduction to the research problem that forms the basis of the research investigation.

### **1.1 Research Background**

With the rapid development of new ideas and technologies, management processes within organisations have been revolutionised. Various researchers have measured the effectiveness of management processes and improved technological awareness, which are necessary for enhanced managerial performance within organisations (Wilcox 1997, Maund 2001, Lippert & Swiercz 2005, Troshani et al. 2011). Knowledge is a driving force behind the economy and the generation of networks within organisations, leading to a dependency on experienced, qualified and motivated employees. It has also given birth to a new era of human resource management (HRM), which has fuelled the development of analytical data processes. These are considered to be essential in helping to fulfil the ever-increasing demands on HRM managers. Like other industrial and organisational phenomena, HRM has also benefited from advances in technology and knowledge, and this has led to the integration of management and technological processes, and the birth of HRIS.

HRIS have assumed an imperative position in executing HR functions effectively and in responding to the existing and potential challenges of HR in today's knowledge-driven economy. With the growth and development of organisational processes, special areas of information and knowledge have appeared, which have necessitated the application of an information system (IS) for better data management. This system may help to utilise the data better for the advantage of HRM. The development of HRIS applications is considered vital for HR Departments in almost every organisation.

Several factors have affected business uncertainty in the 21<sup>st</sup> century, such as a shrinking work force, the global economic crisis and the role of technology in the execution of business operations. These have affected HR managers who have to deal with unexpected challenges in the future. According to Chmeilecki (2012: 52), "Futurists say one thing is certain – HR executives will play a vital role in helping business organisations compete". The emergence of such trends has rendered the traditional functions and systems of HR absolutely inadequate for business competition in today's dramatically changing world market (Beckers and Bsai 2002, Maier et al. 2013).

Leaders and managers of organisations view IT as the only tool that can equip organisations with the required capabilities and efficiencies to enable them to achieve a competitive edge (Tansley and Watson 2000). HR managers, who are responsible for the execution of HR functions, are not oblivious of this fact, and greater focus is being directed on the adoption and use of HRIS (Bokhari 2005).

This effect has been particularly accentuated in research activities, corroborating the importance of the role of HR managers and functions in strong organisational performance. In organisational behaviour and development, many academics and practitioners emphasise the fact that having appropriate HRM is a key factor in the performance of organisations (Wilcox 1997, Maund 2001, Lippert and Swiercz 2005, Troshani et al. 2011). HR practices have quite an effect on the overall performance of any organisation, according to Abu Tayeh (2010), who emphasises that HRM influences how effective an organisation can be. Abu Tayeh (2010) reveals that the more effective the HR practices are in terms of planning, the better the overall performance of the organisation will be. The effectiveness of HR functions can be achieved through the integration of an IS and HR functions.

Dessler (2011) emphasises the importance of HRM practices in organisations, as present-day organisations are operating in times of rapid changes in technology and many global crises, which tend to result in enhanced internal and external competition. Therefore, there is a need for organisations to develop better HRIS in order to effectively address the challenges in information management. According to Mejia et al. (2001), HRM has to do with managing people that work within a specific organisation. This is supported by Theriou and Chatzoglou (2008); they believe that institutions and business enterprises only have access to one major resource to ensure success and survival in this challenging environment: the people working in that particular enterprise. Therefore, managing these people to obtain the best results is the purpose behind the wish to improve HRM practices.

Similarly, the number of IT systems in various organisations has increased exponentially since 1990. The popularity and acceptance of IT tools and the Internet in every sphere of life have resulted in the tremendous growth of IT services. This phenomenon has had a positive impact on workplaces, resulting in better interaction among employees, and improved work conditions and employee productivity (Baloh

and Trkman 2003). From the perspective of both researchers and practitioners, HR managers, acting as internal service providers, hold a fundamental position in the strategic development and performance of an organisation (Rogers and Wright 1998, Iwu et al. 2013).

Furthermore, the development of HRIS within organisations is coupled with the increasing demand for HR to fulfil the evolving expectations of HR managers (Floyd and Lane 2000). Consequently, interest in the development of HRIS has depended on some widespread issues associated with its use and adoption, as demonstrated by many HR-related journals (Strohmeier 2007). HR and IT are coupled to each other in many organisations, especially those that are inclined to use them as strategic weapons to achieve a competitive advantage in the market (Powell and Dent 1997). HR managers are very keen to capitalise on the synergy of these two important organisational assets in order to increase organisational performance.

Consequently, HRIS are viewed as a vital tool with which to usher in the new era of HRM. Similarly, Armstrong (2006) revealed that HRIS can effectively manage the assets of an organisation. These assets are valued by organisational leaders and managers as they help them to achieve the business objectives of their respective organisations. Armstrong further explained that since an organisation comprises a number of people, enhancing the performance of any organisation relies on the acquisition of these people, the development of their different skills, improving their motivation to attain higher levels of achievement, and providing assurance that their levels of commitment will be maintained. In assessing the importance of HRIS to organisations, Lee (2008: p. 5) stated that HRIS is the soul of an organisation and important intellectual property. Its role in fulfilling the strategic objectives of the organisation cannot be denied. From an organisational perspective, HRM always strives to utilise the latest technological advancements in HRIS that will enable them to handle traditional processes using the latest up-to-date technology (Lee 2008).

Using HRIS practically involves keeping track of computer records and allowing information to be processed by appropriate software (Lengnick-Hall and Moritz 2003). The HRIS team is responsible for managing and utilising these records, and gathering the information. After investigating the above-mentioned functions of HRIS, there will be a need to investigate the satisfaction levels of HR professionals and users. There will

also be a need to investigate the level of usage among public universities in Saudi Arabia. It should be kept in mind that all the measures that will be used are adapted from well-established measurements in the literature (Beadles, Jones and Ilowery 2005, Sadiq et al. 2012).

Several changes are taking place in the IT landscape of Saudi Arabia, which is emerging as a big investor in IT. The proliferation of IT in various public and government institutes may raise a plethora of hurdles, which may hinder the successful adoption and implementation of HRIS in these institutes. The recent application of IT in the HR Departments of public universities in Saudi Arabia offers a unique situation to study the adoption and use of HRIS and how it affects the functions of HR.

The basic purpose of this study is to identify the key factors that determine the adoption of HRIS applications, and how these affect HRM functions in the HR Departments of Saudi Arabia public universities. These aspects carry great significance for two reasons. Firstly, they offer a deep insight into the adoption and use of HRIS by Saudi public universities. This is anticipated to provide a better understanding of HR practices, the current status of HRIS usage, and the advantages and obstacles in the way of HRIS implementation. Several public universities have identified the need to transform their HR Departments by integrating ISs into HR functions. Secondly, the proliferation of ISs has precipitated the need to analyse the costs and benefits of these applications, including how the system can affect the functions of HRM in Saudi Arabia public universities, as governmental and university administrations are increasingly determined to update their HRIS. University administration departments need to be enlightened about the advantages and disadvantages of their investments in HRIS applications. They should also understand the antecedents of use and adoption of HRIS so that they can pave the way for the effective and successful adoption of HRIS in their respective organisations, and mitigate any challenge that might affect their functions.

This study considered only those factors affecting the adoption of HRIS applications and how their use may affect HRM functions, from the perspective of HR professionals and leaders in the public universities of Saudi Arabia. The conceptual framework has been developed based on a review of the literature and it proposes that a variety of antecedents affect the adoption and usage of HRIS applications at the organisational

level. Therefore, the next section will present a detailed report of the research problem by analysing Saudi Arabia and the research problem together.

## **1.2 Research Problem**

Several researchers have undertaken various research studies relating to HRIS application, such as the adoption and use of HRIS applications (Urbach and Muller, 2011; Huang et al. 2013; Al-Dmour and Zubi 2014; Haines and Petit 1997; Panayotopoulou and Galanaki 2007, Lau and Hooper 2008). However, these studies were only conducted in the context of developed countries which differ from the developing countries in organizational and cultural contexts. Therefore, the outcomes of these studies, cannot be generalised to resolve the issues of the HRIS use and adoption in organizations in the developing countries due to contextual differences. There is a dearth of the studies concerning the adoption and use of HRIS in the developing world, notably in the middle eastern countries. Nevertheless, few studies have been conducted in the Middle Eastern region such as in Jordan (Al-Tarawneh and Al-shqairat, 2010; Al-shibly 2011/2014, which is emerging as a hub of new technologies and businesses in the Middle East and North Africa (MENA). Given that most existing HRIS studies revolve around Western developed countries, they.

In the context of MENA, specifically in Saudi Arabia, there are many facets of culture that are different from western countries. Previous adoption models developed for the western world seem to be inapplicable to the Middle Eastern countries due to the lack of a wide-scale proliferation of IT applications, cultural differences, the dearth of training tools and a knowledge gap between the Western and Middle Eastern countries. For instance, Hofstede (2001), an influential cultural theorist, gave the Arab world a high score of 68 for the Uncertainty Avoidance Index (UAI). This means that Arab people have a rigid system of beliefs, they like to follow their orthodox points of view, and are usually intolerant to new technologies and ideas. They show a high preference for avoiding uncertainty about the future.

The high UAI score for the Arab people indicates that they are intolerant and reluctant to adopt new behaviours, ideas and technologies, and more inclined to resist any change that is aimed at changing their beliefs. In this way, the current study tries to analyse



adoption and use of HRIS models in the context of Saudi Arabian public universities. Moreover, Troshani et al. (2011) revealed that previous studies have shown a plethora of factors affecting the adoption, implementation and usage of HRIS systems; however, it is unclear whether these variables may affect the adoption process of HRIS in all countries or just for a specific country. Therefore, these studies seem to suggest that many variables may interact to influence the adoption and usage of HRIS, instead of accruing independently. Consequently, they may potentiate or mitigate the relative effects of the adoption and use of HRIS.

There is a great need to evaluate the adoption and use of HRIS models in various organisations in developing countries, and update their viability for different countries and business environments. The inconsistencies in the results obtained by the application of various HRIS models were also observed during the review of previous studies. For instance, the studies focusing on innovation produced variable outcomes that are beyond interpretation and conclusiveness (Souitaris 2003). Similarly, Crossan and Apaydin (2010) explained that the most common characteristic of the research studies relating to innovation is the inconsistency of the outcomes presented in the relevant literature. According to Drazin and Schoonhoven (1996: 66), “Innovation research demonstrates little in the way of common theoretical underpinnings to guide its development”.

The research studies relating to the identification of internal and external environmental factors which impact HRIS applications and practices at the organisational level (specifically, universities) are limited. Consequently, the understanding of the reasons for the adoption and usage of HRIS applications remains incomplete (Yu and Tao 2009, Collins, 2007). Limited research has been done in the Arab world to investigate the antecedents affecting the adoption and use of HRIS. Therefore, there is less understanding of the different cultural and environmental antecedents affecting the successful adoption and use of HRIS at the organisational level.

Most of the research focuses on financial institutions, such as banks and government organisations (Al Shibly 2011, Al-Qatawneh 2012, Abu Tayeh 2012). Other research focuses on service companies and hospitals (Najia 2008). No study to date has examined universities (public universities) and their HRIS management practices. Al-

Shibly (2011) states that research is quite scarce in this area and should be carried out in relation to the efficiency of the systems in the Arab world.

Consequently, the main goal of the research at hand is to analyse the adoption and use of HRIS in Saudi public Universities, and how it can help to improve the practices of HRM. Another goal in this study is to determine whether such systems will lead to higher organisational achievement.

Therefore, the next section will present the research question of this study.

### **1.3 Research Question**

The present research answers this question.

*How do the HR departments apply and implement HRIS in the public universities of Saudi Arabia?*

### **1.4 The Aim of the Study**

The study aim to investigate the implementation and use of HRIS in the HR departments in the Saudi public universities .

### **1.5 Research Objectives**

The main goal of this study is to investigate the adoption and use of HRIS and how it can improve university performance. To achieve this goal, the study attempts to achieve the following objectives:

- To critically analyse the existing literature in the area of adoption and use of HRIS in the HR department of public universities in Saudi Arabia.
- To explore the current level of use and effectiveness of HRIS in Human Resource departments in Saudi public universities.
- To explore the most appropriate dimensions that influence the use and adoption of HRIS in HR Departments in the public universities in Saudi Arabia
- To propose a conceptual HRIS framework for examining the adoption and use of HRIS in the public universities of Saudi Arabia.
- To test empirically the proposed conceptual HRIS framework in the HRM departments of Saudi public Universities.
- To provide organisational recommendations based on the finding of this study for the Saudi public universities.

## **1.6 Significance of the Study**

As mentioned before, the KSA is one of the developing countries with a relatively short administrative history. Due to its location, the country is endowed with natural gas and oil resources. The current policy of the Kingdom is to improve and support its citizens, and the country itself, through higher education and a qualified native working force. At the end of the 1980s, there were only seven universities that provided higher educational degrees, but now the number has increased to thirty-two and may still be higher. Even with the overall increase and development, there are still some significant technological problems. For instance, there are few universities with an Internet connection; this has prevented universities from fully implementing IT. The universities operate in isolated networks and there is no unified standardisation among them to maintain consistency within the sector of higher education. The impact on various departments is huge – it has caused weak performances, unsatisfactory quality of work, a lack of communication, and high costs of management for HR Departments.

It seems that the KSA has the largest intake of economy in the Gulf Cooperation Council (GCC) and experiences strong demographic changes, which affect not only its political stability but also its economy. In line with this, it is the best moment to introduce information systems in order to maintain the levels of progression and achievement in the utilisation of the country's natural and HRs (Achoui 2009). However, in order for these changes to occur, there is an inescapable need for significant improvements in the HR sector (AlGassim, Barry and McPhail 2014).

It should become a common practice for HR Departments to function rapidly and with great accuracy. In the contemporary world dominated by IT, it seems to be obvious that such changes must merge with computer-based applications and the adoption of IT in public organisations (Al-Ghamdi et al. 2015, Afiouni, Ruël and Schuler 2014). The reason for that is the fact that IT transfers the traditional processes of work into an electronic-based system, which makes them more effective and efficient. Unfortunately, many organisations are still very concerned about how to handle the problems and opportunities of IT systems.

The adoption and use of IT in Saudi's public organisations is examined in order to understand the important and functionality of IT and how it influences various functions

needed by both public and private organisations. Al-Gahtani (2003) conducted a survey of 1,200 knowledge workers in 56 public and private organisations across the KSA. The work reveals the importance of the adoption of IT in the country as a great chance to enhance development.

Information technology plays a key role in ensuring efficiency and productivity in many kinds of organisations. Those that have adopted IT systems have experienced a competitive advantage due to higher productivity and better decision making (Al-Gahtani 2003). It is essential to note that computer-based systems provide various significances in terms of production and cost reduction (Davis et al. 1989, Alsheha 2007). In Saudi Arabia, the introduction of IT systems not only brings technical benefits, but also reduces the tasks within the Saudi workforce (Al-Khowaiter, Dwivedi and Williams 2014). The growth of IT systems in the Kingdom could then become a great solution for local organisations. These technologies allow companies to upgrade the capabilities of their HRs, allowing them to perform their functions rapidly with greater accuracy (Afiouni, Ruël and Schuler 2014).

To ensure human resource functions are performing rapidly, many scholars argue in favour of the use of modern technology such as HRIS (Hendrickson 2003). The increasingly profound changes in social and organisational requirements are putting pressure on professionals and employees, who have to deliver a high-quality service quickly and accurately (Pfeffer 1997). These systems can enable them to do that in the most efficient and time-saving way.

The shift of HR management's attention to a workforce performance strategy is considered as one of the most challenging variables in the whole modernisation process of contemporary organisations (Davila 2005). It acts as an important contributor to the organisational management strategy (Rodriguez and Ventura 2003). The major reason for that is attributed to modern technology systems such as HRIS, which comprise the functional processes of obtaining, saving, analysing, retrieving and managing data (Lippert and Swiercz 2005).

Such systems provide many benefits for any organisation (Beckers and Bsat 2002). These include helping to shift the role of HRM from transactions to strategic HRM; helping to increase competitiveness by developing and enhancing HR activities and procedures; re-engineering the whole HR Department in organisations; and finally,

helping to create a greater range of HRM reports in public organisations in Saudi Arabia (e.g. the Ministry of Education have already incorporated HRIS because of its many advantages).

A study is needed to examine the adoption and extent of usage of HRIS and whether these affect HR functions and staff. This may provide some insights and help HR practitioners to acquire a better understanding of the current status of HRIS adoption and usage in Saudi Arabian public universities. This may help to improve the Kingdom's HR capability, and enable the experts to familiarise themselves with new developments in IT, such as HRIS.

Analysing the existing literature on HRIS implementation and success, it can be seen that the topic of HRIS has not been fully investigated by researchers and scholars (Blount and Castleman 2009). Published studies of these systems have mainly focused on their benefits and shortcomings (Lippert et al. 2005, Kovach et al. 2002, Abu-Shanab and Al-Tarawneh 2010, Gunes et al. 2003); their impact on performance (Chen et al. 2014, Alsheha 2007, Hanif et al. 2014); security (Lippert 2005); and IS success models (Ramezan 2010, Alshaliby 2011, Bal et al. 2012). While a few studies (Teo et al. 2007, Troshani et al. 2010/2011, Ramezan 2010, Alshaliby 2011, Bal et al. 2012) have used well-known models of IT adoption and success to advocate HRIS adoption and success at all levels, none have looked at the user level of HRIS adoption in public sector organisations in general, or in Saudi Arabia in particular. Furthermore, none of these studies have empirically validated a conceptual model that can consider the mandatory use of HRIS.

Given the theoretical background of the models, each are suitable in the context to examine public sector organizations. However, the DeLone and McLean IS success model was adopted so as to provide a guiding framework for this research, which the Kingdom of Saudi Arabia was use to conduct the research.

The most significant contributions of the study are explicated below. In the literature on HRIS and HRM, researchers and practitioners appear to agree on the importance of the use of HRIS, and the efficiency of HR practices (Al-Dmour et al. 2014, Ball 2001, Katou and Budhwar 2006, Hussain et al. 2007, Dery et al. 2009). Most HRIS-related studies in Saudi Arabia have focused on financial institutions, such as banks, or industrial and service organisations, such as telephone companies and hospitals.

This study is the first of its kind that tries to measure the extent of HRIS use and adoption, and its impact on the HR Departments of the public universities in Saudi Arabia. It also contributes to the research on HRIS in general as it diversifies the target groups in the study. By choosing an emerging country in the Middle East, namely Saudi Arabia, the study is expected to provide a cross-cultural understanding of the way HRIS applications are being implemented in other parts of the world and whether the use of these systems differs in various areas.

The conceptual framework has been developed through this study, which measures the level of HRIS use and adoption, and to find the extent to which it affects the functions of HR departments at public universities in Saudi Arabia. The framework was built in the light of cultural factors and elements from Delone and Mclean model (2003, which is studied in the area of HRM).

As far as higher education and research is concerned, the Middle East in general and Saudi Arabia in particular does not seem to be comparable with developed countries in terms of performance. This can be viewed in the results and outcome of their performance among Middle Eastern universities, with the exception of those placed in the State of Israel. In the Arab world, there are only a couple of universities that have made it to the list of the top universities in the world. According to the Education Development Index (EDI) and its components (2004), Saudi Arabia is known for the quality of its development in the educational system and is ranked 97th for its high standards (Maroun et al. 2008).

During the last few years, Saudi Arabia has paid more attention to the status of education, particularly within Saudi universities (higher education) (Maroun et al. 2008). This shift can be seen in the form of a dramatic increase in the number of public and private universities during the last decade. This surge in the number of educational institutions has led to the recruitment of a large number of academics from different parts of the world. This was necessary to help maintain a high quality of performance and to contribute positively to educational reform processes.

The present study endeavours to examine the importance of HRIS applications and the extent to which HRIS affects the function of HRM and HR staff, which are assumed to have a direct influence on the performance of organisations and institutions. Through achieving an understanding of the extent to which these types of systems are being

utilised, the current research is expected to yield useful findings and recommendations for HR practitioners and managers within Saudi higher education institutions.

HR managers can use the findings of this study for decision making with regard to the successful adoption and usage of HRIS in Saudi universities. Additionally, it can support HR managers in the following ways: it will enable them to successfully adopt HRIS within the HR Departments in Saudi Arabia's universities. It can also help them to improve on the performance of HR Departments, by taking into account the recommendations suggested by this study. Additionally, it will help academics to consider the development of new HRIS models in the context of developing countries such as those in MENA.

As mentioned earlier, the study aim to investigate the implementation and use of HRIS in the HR departments in the Saudi public universities. Also, this study will bring forward significant knowledge to researchers, as it is the first of its kind to be conducted in public universities in Saudi Arabia. It is anticipated that this study will make contributions to HRM practitioners, the practices of management, and the academic fields of HRM.

The study will serve as a symbol of a cross-cultural investigation and analysis of HRIS applications and their adoption in the Saudi Arabian educational environment in particular, and in the Middle Eastern environment in general. Therefore, this study may have an impact on both the internal and external environment affecting the adoption of HRIS, and it can show how various individual interaction factors can affect the successful adoption and usage of HRIS. Furthermore, this study may generate very important hypotheses for further research, which may be used to carry out various research studies in different universities of MENA countries.

Additionally, it may generate a new conceptual framework with a new construct to add to the already existing DeLone and MacLean (2003) model on the adoption of HRIS.

### **1.7 Conceptual Definitions**

**HRIS:** This system is used to employ a well-known procedure that is used for maintaining, storing, collecting and recovering information about an organisation. The system deals with HR and organisational features and activities (Kovach et al. 2002). It is defined as an “integrated system used to gather, store, and analyse information

regarding an organisation's HRs comprising of databases, computer applications, hardware and software necessary to collect, record, store, manage, deliver, present and manipulate data for HR functions" (Hendrickson 2003, P 8).

**System quality:** "performance of the IS in terms of reliability, convenience, ease of use, flexibility, response time, and other system metrics" (Petter et al. 2008, P 4).

**Information quality:** the "characteristics of the output offered by IS such as accuracy, completeness, relevance, and understandability" (Petter et al. 2008, P 4).

**Service quality:** "the support that system users receive from the IS department and IT support personnel for example: responsiveness, accuracy, reliability, technical competence, and empathy of the personnel staff" ( Petter et al. 2008, P 4).

**Subjective norm:** Individual's perception or "opinion about what others believe the individual should do" (Ajzen 2003,P3).

**System use:** "the degree and manner in which staff utilise the capabilities of an IS such as: amount of use, frequency of use, appropriateness of use, extent of use, and purpose of use" ( Petter et al. 2008P4).

**User satisfaction:** "users level of satisfaction with reports, and support service" (Petter et al. 2008, P4).

## 1.8 Structure of the Thesis

This thesis has been divided into six chapters. The contents of these chapters are briefly outlined below:

- **Chapter 1:** presents the research background and rationale of the study. It also elaborates on the motivation of the study, its aims and objectives, the significance of the study and the thesis structure.
- **Chapter 2:** provides a critical review of previous research works undertaken in the field of HRIS. It presents the limitations and gaps in the research pertaining to the adoption and use of HRIS.
- **Chapter 3:** provides the methodology adopted to carry out this research. The research philosophy, research design, data collection methods, data analysis, justifications for the research techniques and the validity of the selected research approach are detailed in this chapter.



- **Chapter 4:** presents the research findings relating to the antecedents affecting the use of HRIS, obtained from a qualitative phase research approach (Phase I) selected for this work. It shows the main results pertaining to the factors affecting the use of HRIS.
- **Chapter 5:** presents the quantitative relationship between the different dimensions of the proposed HRIS model in terms of its use and user satisfaction. The results presented in this chapter are obtained from a quantitative research approach (Phase II) selected for this research.
- **Chapter 6:** describes the discussion of the main findings obtained from Chapters 4 and 5. In this chapter, the results of this study are evaluated and underpinned by the previous research.
- **Chapter 7:** concludes the findings of the research and provides recommendations for Saudi universities on how to successfully adopt HRIS and the factors that may affect the HRM function. Suggestions for future works are also provided in this chapter.

## 1.9 Summary

The aim of this chapter was to introduce the reasons for the chosen research topic and to highlight its importance in the subject field. It served as a general overview of the chosen topic and provided explanations of its particular uniqueness. The research background directly referred to previous studies emphasising the gap in the research, explaining the great interest in the subject matter.

The research topics are described in the following sequence: firstly, the research background of the KSA is described in order to familiarise potential readers with the history and current developmental state of the country, and to justify why Saudi Arabia was chosen as the location of the project. Secondly, the research problem was discussed in detail and presented with reference to what other researchers have done. Thirdly, the aim and objectives were presented in order to clarify the possibility of a practical implementation of the results of the investigation. Subsequently, the research questions were raised. Additionally, the significance of the study was explained and explored in full detail, and the conceptual definitions were presented to clear any ambiguity in the research terminology. Therefore, the next chapter will provide an exhaustive review of

previous works in the HRIS domain and build the theoretical model for the current study.

## CHAPTER 2: LITERATURE REVIEW

### **2. Introduction**

The aim of this chapter is to present a selection of the literature that has been a starting point for conducting this empirical research. The theoretical background therefore includes the review of publications connected with the topic of the impact of HRIS on HRM practices.

In order to maintain clarity, it is worth mentioning that this review will be guided by the following specific objectives: (a) to give a detailed evolution of HRM; (b) to examine the current state of knowledge related to HRM; (c) to investigate the adoption and success of HRIS; (d) to analyse the extent of use and how HRIS systems affect the functions of HR and staff effectiveness; and (e) to identify key areas for further study. This chapter provides up-to-date research results and data about the different themes. Therefore, it provides the reader with a greater exposition of HRM and HRIS within the limits of the aims and objectives of the current research.

A range of sections have been provided to supply the thesis with both theoretical and practical research information. These include the definitions and evolutionary histories of both HRM and HRIS, the functions and benefits of HRM and HRIS within and for the organisation, the adoption of HRIS in Saudi Arabia, the measurement of HRIS success within an organisation, and the development of a conceptual model and hypotheses for the current research.

### **2.2 An Overview of Human Resource Management**

Human Resource Management is an important asset for any institution, as it is a major source of attaining competitive advantage. Managing this aspect of each institution is the most difficult, especially in comparison to managing technology and capital, with no direct human interaction. Human resource management has been classified into several types, among which the most common is strategic HRs management. This subgroup of HRM has become an important topic for many contemporary research studies (Hashim, 2010). As a result, some basic theoretical issues have been agreed (Stroh and Caligiuri 1998). Strategic HRM has facilitated the understanding of the

relationship between strategy, human resource management, and human capital as well as organisational performance.

Strategic HRM has played a key role in management practice and research over at least the last three decades (Gannon et al. 2015). An analysis of the topic can add strategic value as it contributes to the organisational success. It seems obvious that people are crucial elements of an organisation's performance. In higher learning institutions such as universities, HRs are of greater importance as they are referred to as the intelligent capital – the essence of academic achievement (Al-Tarawneh and Shqairat 2010). They serve as both human and intellectual capital. In each institution there are various categories of employees who contribute their collective value of abilities, skills, knowledge, life experiences and motivations for the growth of the organisation (Ehnert 2006).

What is essential is to understand the idea that HRM enables better utilisation of human talent in an efficient and effective way, in order to accomplish organisational objectives and goals (Kehinde 2012). The key to this includes the changing globalised workforce and demographics that should always be included in detailed analysis. HR Departments ought to understand these matters and implement them in order to have a direct contribution to organisational strategies. An effective HR Department should embrace such aspects as new recruitment techniques, compensation and remunerations practices, equal employment opportunity strategies, health, security programs and rewarding talent management approaches. Time and research have shown that effective HRM can make practical differences in terms of productivity, profit and quality of work (Klessing and Harvey 2005). What is also worth mentioning is the fact that in the contemporary fast developing world of IT, technological changes have an enormous impact on practical implementation of general HRM standards (Zin 2012). Information Systems are one of these fields of IT, and their design can make valuable contributions to the whole process and improve its effectiveness.

In organisations, the basic unit that is responsible for Human Resource Management is the department dealing with human resources. Currently, most HR divisions have grown from traditional and partial roles (custodians of personnel information) to more complex strategic approaches. The HR Department is not the only one to practice HR

management duties, as other sections of the organisations also practice HR activities and policies (Muhammad, Naser and Khalid 2012).

HRM covers a wide range of activities. Some of these areas include incentives, reward practices and promotions within work places. Incentives entail remuneration systems, system appraisal, career advancement and development. On the other hand, the work organisation structure refers to the distribution of decision rights between workers, managers, job designers, team workers and information providers.

Without a HR Department and the management, any organisation would collapse from within (Randall 2000). Organisations have some expectations with regard to Human Resource Management and its relationship with the employees. Some of these expectations include making use of the talents, abilities and skills of the workers in order to achieve the objectives of the company. Additionally, another expectation relates to the provision of a secure and conducive working environment where the workers feel free to contribute to the growth of the organisation (Sean and Diane 2005).

Before now, HRM was all about being a firing and hiring department. However, it has turned into a section of an organisation where people search for answers for their own benefit and progress, which further entails employee development and training. Modern HRM is guided by several principles. The most important principle is the fact that it is the most crucial asset of any organisation (Achoui 2009). Another principle guiding this resource is clearly elaborated by Michael Armstrong (2014), who stated that the success of a business would be achieved if the policies and procedures guiding the personnel were closely linked. The third principle holds that HR is responsible for finding, securing, guiding and developing employees, whose desires and talents should be compatible with the operations of the company (Achoui 2009). Therefore, Armstrong summarised HRM as a strategic approach in the acquisition, development, motivation and management of companies.

### **2.2.1 Definition of HRM**

Different authors have provided various definitions of HRM and hence there is no universal definition (Ngai et al. 2007). For example, HRM has been defined as a system of activities and strategies that focuses on managing employees at all levels of an organisation to achieve organisational goals successfully (Byars and Rue 2006: 35).

Redman and Wilkinson (2008: 46) defined HRM simply as the management of the affairs of employment within an organisation. Boxall and Purcell (2008) explained HRM in the western world as all those associated activities involving the management of human capital and its utility for the fulfilment of the organisation's mission and policies. Generically, the definition of HRM presented by Boxall and Purcell (2008) seeks to achieve four key goals: staffing, performance, change management and administration. Primarily, personnel and HR professionals deliver these organisational objectives. This, therefore, suggests that HRM refers to the process of managing human talent to achieve the objectives of an organisation.

Managing human talent through HRM covers the process of selection, recruitment, employee relations, the management of employees' health and safety, and talent development in firms. Consequently, HRM is not restricted to hiring and firing, but it is also related to the development of talent by assessing the training and development needs of employees within an organisation. According to Bourdreau and Ramstad (2005), the organisational leaders' attention and HR investments are being directed to the management and retention of "pivotal talent pools", which are considered important determinants for the high performance of organisations. For instance, in the case of Westcoast Energy, a potential pivotal talent relates to an "employee who consistently contributes at a significantly high level. Confidence exists that an individual will move to the next job band within three years" (Chug and Bhatnagar 2006: 229).

All these definitions originated from western-based cultures and companies and none of them can actually be directly implemented in the higher educational environment of different countries due to cultural differences. With regard to MENA countries, it can be suggested in theory, but in practice may lead to chaos in the principles, traditions and mentality of Middle Eastern countries.

### **2.2.2 Core Functions of Human Resource Management in the Modern Era**

HRM is an important concept for any institution, as it is a major factor in accomplishing a competitive advantage (Gable et al. 2008). The most common type is strategic HRM. This sub-section of HRM has become a significant topic for research. Stroh and Caligiuri (1998) reported that strategic HRM has facilitated the understanding of the relationship between strategy, HRM, human capital and organisational performance. This concept has played a key role in management practice and research over the last

three decades (Shin 2003). The main focus of HRM practices is on the streamlining of the human resources of an organisation for its success. Employees are a crucial part of any organisation's performance (Gable et al. 2003). In higher learning institutions, such as universities, human resources are also referred to as intelligent capital. They add collective value to institutions and businesses through their abilities, skills, knowledge and life experiences, as well as inspiration for the growth of these institutions (Ehnert 2006).

Time and research have shown that HRM can make practical differences in terms of productivity, profit and quality of work (Kiessling and Harvey 2005). Institutions of higher education universally continue to be the basis of intellectual skills and knowledge. Furthermore, universities also have their own HR Departments, which are responsible for the efficiency of various organisational aspects, such as staff, the quality of teaching, and the smooth operation of administrative functions. The organisations have HR Departments to deal with the management of their human resources and to achieve a competitive advantage in their respective business sectors (Solomon et al. 2013).

Currently, most HR divisions have assumed various roles, ranging from the traditional role as a custodian of personnel information, to more complex strategic approaches, such as managing the tacit assets of organisations (Sikora and Ferris 2014). HR Departments not only practice HR management duties but also, in other sections of organisational practice, deal with HR activities and policies (Khan, Khan and Mahmood 2012). HRM covers a wide range of activities in different areas, including incentives and work organisation. According to Randall (2000: 239-260), an organisation without a HR Department will collapse from within.

There are some expectations with regard to HRM and its relation to employees, which include making use of the talents, abilities and skills of the workers in order to achieve the objectives of the company. Another expectation relates to the provision of a secure and conducive working environment where the workers feel free to contribute to the growth of the organisation (Sean and Diane 2005). HRM has become more than just a firing and hiring department. It has turned into a section where people find solutions for their queries and even deal with social issues (Kehoe and Wright, 2013). This, therefore, requires that the human resources of an organisation be managed

strategically. In the modern technology-driven era, this can be achieved through the integration of an IS into HRM practices. Many modern-day organisations have resorted to the adoption of an IS to help them gain a competitive advantage in the market (Al-Shawabkeh 2015).

### **2.2.3 Development of Human Resource Practices in Saudi Arabia**

To understand HRM in the context of Saudi Arabia, it is important to gain an overview of the HRM and business systems in the Middle East region in general, as it can be assumed that these are very similar in each country of MENA. According to AlObaid (2003), the term “Middle East” refers to a cultural area that does not have specific borders, namely: Algeria, Bahrain, Iraq, Egypt, Iran, Israel, Jordan, Kuwait, Lebanon, Libya, Saudi Arabia, Syria, Morocco, Oman, Qatar, Tunisia, the United Arab Emirates, and Yemen (Bellin 2004). Nowadays, this region is politically and economically significant due to extensive natural resources and a combined population of more than 400 million. However, the Middle East is less developed in terms of international and cross-cultural management research. It is assumed to be a developing region of the world with a relatively short history, and to be developing in the areas of business experience, higher education, legislature and jurisdiction (Ali 2009). According to Ali (2010) and Ayman et al. (2007), the region still struggles with religion-based conflicts and wars. Therefore, this has affected the region and it has significantly less experience and preparation in managing human resources and following western examples (Budhwar and Debrah 2001).

While international and comparative HRM issues have been discussed and empirically examined by researchers in developed countries for about a decade, the research has so far concentrated on only a limited range of countries and regions, such as European and American institutions. Middle Eastern countries have not been considered (Mellahi and Wood 2001, Pfeffer 1998). It is an undeniable truth that HRM and its implementation in the Middle East region have been neglected and are not yet recognised (Metcalf 2007). Although effective HRM practices have become a critical component of the progress of a few Middle Eastern countries in the last few years, their HRM has been criticised in many studies, especially in relation to the effectiveness of its execution (Bennell 1994, Budhwar and Debrah 2001, Grindle and Hilderbrand 1995). Until recently, Saudi Arabia had few policies towards HRM practices (YanXia and Saeed



2015). However, since the Saudi Government has realised that oil and natural resources will not be produced forever, the country has understood the necessity to develop other sectors of economic growth, including the use of human capital.

The academic work in higher education institutions is one of the areas where HRM plays a crucial role in maintaining national stability; the other sectors that can contribute to the use of human potential are the hospitality and tourism sectors. However, this thesis will focus only on higher education institutions, and effective execution of HRM with the help of information systems (McNabb and Whitfield 1990, Budhwar and Debrah 2001).

The peculiarity of the context for HRM development in the KSA was restricted by policies from the late 1960s until the year 2000, and only in recent years have attitudes and approaches towards modernisation shifted (Mellahi 2007). However, the role of HRM in the KSA is still unappreciated and remains undeveloped. For example, a survey conducted by Fadhel (2007) indicated that out of 52 Saudi companies, only 63.5 per cent of the respondents had a HRM structure, with only 40.4 percent having a HR development (HRD) program. Further, some HRM functions, including training and development programmes, were implemented by different structures, such as the sales or finance departments, which meant that many of the small and medium enterprises had no professional HRM structures whatsoever. Additionally, the survey found that 78.8 per cent of the training programs were carried out in the form of on-the-job training by other departments, rather than by the HR Department. This meant that this training was provided by unskilled people rather than by HR professionals. Nowadays, the KSA is facing dramatic changes in leadership mentality. The HRM and HRD have begun to gain ground, particularly in large organisations (Achoui 2009). The necessity to deal with employability problems and to manage local human potential has forced institutional and commercial organisations to seek help with HR policies and their implementation strategies, in order to continue being profitable and competitive in the international market (ibid).

Furthermore, due to religious, cultural and traditional aspects, the working environment was very male-oriented, with a shortage of female contributions. This was due to external restrictions, mentality and, most commonly, imposed limitations. Female participation in job opportunities is very often restricted as a result of religious beliefs,

and this results in an insufficient native work force. There was therefore a need to look for foreign workers to balance the workforce in Saudi Arabia (Achoui 2009).

On the other hand, due to the ineffective utilisation of HRM practices, there is an increase in the level of unemployment (Al-Gassim et al. 2014). Thus, unemployment is one of the most crucial issues concerning HR planning in Saudi Arabia, reaching 25 per cent in 2003 and increasing to 30 per cent in 2008. Currently it is expected to increase to 36 percent in 2012 (Alanezi 2012).

The government has not remained passive, and a significant effort has been made (especially in the last ten years) to improve HR by replacing foreign workers with Saudis (Nasief 2015). However, the private sectors still prefer to keep employing foreigners. The reasons for this include the negative perceptions carried by Saudi businessmen and women that Saudi citizens' labour is more expensive and less productive than that of guest workers (Tessema and Soeters 2006).

Therefore, it seems to be of great importance to highlight the benefits from sufficient HRM practices and their impact on employees' behaviour and employers' profits. Effective HRM practices may positively impact employees' accomplishments, which may result in improved performance. As a consequence, unique and effective HRM practices can be a source of competitive advantage for organisations (Kazlauskaite and Buciuniene 2008).

A number of studies have demonstrated a positive relationship between specific HRM practices and financial outcomes (Wright et al. 2003, Huselid 1995, Rawashdeh et al. 2012). The realisation of that fact could play a significant role in Saudi Arabia's position in international markets, being mainly supplied by a native work force in order to improve local employability.

Research has also demonstrated a positive relationship between perception of HRM practices and customer satisfaction with service, as well as with indicators of organisational performance (Alfes 2013). Zerbe et al. (1998) in their study proved the proposition that perception of HRM practices determines the behaviour of an aircrew towards the passengers, because perceived effectiveness of HRM practices has an impact on the overall culture of its service. This could also contribute to building and maintaining Saudi's position on the international trade market and to creating an image

of a reliable and competitive working environment where employees' satisfaction is reflected in the prosperity and quality of the service.

Effective HRM practices produce an environment of wellbeing for employees, which may result in a more effective delivery of services (Schneider and Bowen 1993). Studies in the context of service organisations have proved that the causal relationship between HRM practices and service qualities has an impact on overall organisational performance. What is more, besides service qualities and customer satisfaction, the existence of effective HRM practices may also lead to organisational commitment (Mathieu and Zajac 1990).

The contemporary Saudi government seems to understand such issues, and it uses oil revenues to expand social services and to build roads, schools, telecommunications, and other infrastructural facilities (Mellahi and Wbod 2001). To carry out these improvements, the government hired large numbers of workers and professionals from abroad. Saudis occupy all middle- and upper-level government service positions, while most clerical workers, labourers, and lower-level service industry workers come from other countries. Professional and technical jobs are split roughly evenly between Saudi citizens and expatriates (Nasief 2015). According to the World Bank in 2015, the estimated labour force in Saudi Arabia consisted of 10 million workers. In the same year, agriculture employed about 19 per cent of the labour force, industry about 20 per cent, and services 61 per cent. Women made up only 18 per cent of the labour force in 2015, with Saudi women representing a tiny percentage, but growing very fast.

Therefore it is of great importance to supply native citizens with skills and knowledge so that they can carry out their working duties in an efficient and professional way. This can be achieved by providing them with education and training to the highest international standards. What is more, these institutions and universities must be equipped with HR Departments and follow their strategies to receive and provide the best service and preparation for their future generations (Mellahi 2007).

Unfortunately, in Saudi Arabia, very limited studies have been carried out on HRIS in public universities, and this provides an opportunity for investigation. The previous studies were undertaken in different institutions such as hotels or the hospitality sector (AlGassim et al. 2014). Higher education institutions are very significant in the country's development as they are places containing national intellectual potential. The

future of each nation should depend and rely on their intelligence and work in order to build, grow and strengthen any other sectors (Alamri 2011). Higher education institutions are not only places of study, development and innovation, but should also be regarded as a great business opportunity to generate and create relevant income as part of the national budget (Krieger 2007). Instead of studying abroad, citizens would prefer to choose local universities to study. This will only happen if the standard of education has been improved significantly, thereby attracting international students from abroad, which would make a great contribution to national income. These improvements would need to be broadcast to potential students at home and abroad.

#### **2.2.4 Practical Implementation of Human Resource Management Techniques**

The greatest challenge that the government and business owners must realise in contemporary KSA is that employees are the core entity in any organisation as they perform essential tasks within it (AlGassim et al. 2014, Budhwar and Debrah 2013). A firm establishment of HRM can help to support and manage this human capital, and this will always play a pivotal role in any institution (Mathis and Jackson 2011). Emphasis ought to be put on the benefits that can be gained by ensuring that all of the employees' needs are met, and that the employees have control over their work lives. Besides this, Messmer (2011) suggests that every organisation should recognise the necessity to provide information, allow employees to voice their opinions, and be flexible. This enhances the organisation's success rate. Therefore there is a possibility to implement such an approach in the institutions in the higher education sector.

HRM research reveals that HRM practices play an important role in supporting and influencing organisational outcomes, by shaping the attitudes and behaviours of their employees (Armstrong 2010). This is achieved by molding the perceptions towards the organisation of most of the employees. In the Saudi Arabian context this can have an enormous impact on maintaining high morale among Saudi employees, who very often could feel intimidated by the competitors from abroad. This is because they may gain greater international awareness and experience, especially with degrees from prestigious and globally recognised higher education institutions.

It is of great importance that future native employees and their employers understand that HR practices influence the effectiveness of an organisation by encouraging employees to work hard and accomplish organisational goals (Armstrong 2010).

According to Huselid (1995), in a study involving 900 different organisations, HR practices could be categorised into two groups: those HR practices that enhance the employees' skills and those that enhance their motivation. These two groups, especially in a developing country in the context of higher education and university life, can have a significant impact on the success or failure of their performances and achievements.

The link between HR practices and organisational performance has been established by research in the private sector, suggesting that the HR systems have great strategic potential and can drive organisational efficiency (Zin 2012). The results further suggest that public institutions such as universities have begun to move towards designing and delivering HRM practices. Their main focus has been the need to increase employees' performance and competencies. This has resulted in the creation of a HR system with both vertical and horizontal alignment around those competencies (Al-Khowaiter et al. 2013).

The research on which the literature review is based is always located in western countries, where the level of development in IT and the HR sector has already been recognised and appreciated (Al-Dmour et al. 2015). However, such research has never been undertaken in developing countries until recently, when the practices and research of HR started to become noticeable. This is because some crucial investments and innovations have been implemented (Obeidat 2012).

Several efforts have been made to determine the best HR practices, and several practices were identified, all falling under the two categories mentioned above. According to Griffin (2013), there are several key factors in HRM that determine the effective performance of employees in any organisation. These include recruitment strategies, employees' pay and benefits philosophy, training and employees' career development systems, employees' support programs, and the organisational structure and culture, among other factors. Therefore, in order to effectively retain high-quality employees in an organisation, these factors should be managed harmoniously.

All the key factors mentioned above may be of importance, especially in middle- or low-income paying organisations such as universities. This leads to the development of the next section of this thesis, which introduces the concept of an IT/IS in the Saudi Arabian context, which can help to provide a suitable platform for the successful implementation and adoption of modern HR development.

### 2.2.5 IT/IS in Organisations in Saudi Arabia

Nowadays, information technology (IT) and information systems (IS) have become the most crucial elements in any business (Troshani et al. 2011, Bal et al. 2013). Therefore, it seems to be impossible for any organisation to function without them. In fact, public and private organisations have invested a large sum of money into this field, in areas such as computer software and hardware, in order to maintain its high quality and increase their success rate (Seddon et al. 2002). The amount of money and time invested in its development and implementation is necessary because it has become an essential element of development in all contemporary fields that demand progress (Al-Gahtani 2003).

However, in many cases, the reality is different, as there is still visible opposition towards technical development, especially in cases when it fails and gives an impression of not being trustworthy. It has been recognised that:

*“there are still technical issues related to functionality and interoperability, discussion affirmed the emerging consensus that problems are due to sociological, cultural, and financial issues, and hence are more managerial than technical”*  
(Kaplan 2009: 291).

The implementation of IT in developing countries is on the increase (Al-Qatawneh et al. 2012). Organisations in developing countries have recognised its importance, for example the ability of the system to process information on time and to help to solve developmental problems (Al-Shibly 2011). The IT influence in Saudi Arabia has created more awareness and organisations have recognised its benefits, so that both government and private sectors have improved their businesses by enhancing the use of technology (Al-Gahtani 2003). Already the government of Saudi Arabia has invested in many projects, such as the Saudi National e-Government Portal (Alateyah, Crowder and Wills 2013). Nowadays, technology can assist in helping citizens and non-citizens to gain different services via the Internet, which was not possible over a decade ago (Alateyah, Crowder and Wills 2013). The majority of western countries familiarised themselves with the use of the Internet one or two decades ago, while in Saudi Arabia the Internet world is just beginning (Al-Shohaib and Frederick 2010). There are still many Saudis who travel around the world in order to receive education or to do business, and due to easy Internet access they can still control their business and talk to

their relations. Also, academic performance has improved significantly due to the World Wide Web, which provides access to international data bases, publications, research engines and also e-learning platforms. These features have only just been introduced to developing countries (Stepanova 2011).

Therefore, organisations should implement IT solutions as part of their procedures and encourage employees to develop, maintain, progress and exchange information. IT has become a vital part in any business or public institution and it can help organisations to achieve their strategies and enhance the relationship between departments. For example, sharing interdisciplinary knowledge within different institution has massive advantages (Edington and Shin 2006). However, in order to maintain satisfaction between IT users and providers, some conditions must be fulfilled. Three factors are important for the successful implementation of IT, which are: user satisfaction, top management commitment and IT experience (Al-Adaileh and Al-Makhadmeh 2008). Many organisations can only benefit from this technology by discovering the main issues that can affect their IT (Alateyah, Crowder and Wills 2013).

Therefore, according to the Central Department of Statistics & Information (2013), in the context of Saudi Arabia specifically, where the economy is based mainly on oil production and the population is above 28 million, obtaining and maintaining the latest technology (especially computer technology) should be a major goal in the national computerisation program (Al-Zharani 2011). Moreover, IT has an important role in improving the efficiency and productivity of private and government organisations (Al-Gahtani 2003). Successful IT adoption and implementation can result in a significant improvement in performance (Xiang et al. 2009, Abdullah et al. 2006, Kim et al. 2009). For example, in an empirical study which examined productivity levels before and after IT implementation, it was found that there was an increase of between 15 and 34 per cent (Al-Gahtani 2003).

It is only sensible to state that an increasing deployment of IT in developing countries could help to solve their developmental problems. Innovative IT solutions in Saudi Arabia can help to boost productivity growth, and are also an essential component of controlling the working sector and national employability (Al-Khaldi and Wallace 1999, Alsheha 2007).

However, there are still many obstacles that should be overcome and fought against, such as consistency in the implementation and management of HRIS in Saudi Arabia. Unfortunately, there are still many organisations or institutions that have incomplete installations of hardware and software, which cause a series of technical problems. On the other hand, what can be assumed as a positive symptom is the general tendency to rely and trust new equipment and services (Cash et al. 1992).

Nevertheless, there are still examples of research conducted a few years ago that investigated the implementation of IT in Saudi Arabia. Al-Zharani (2011) found that there was a lack of trained personnel and skills to manage the use of information systems, a lack of available technology training programs, and a lack of coordination among organisations that sought better ICT in the KSA. One critical element is the digital division within Saudi Arabia; in 2010, only around 3.1 million people, or 12 per cent of the total population, used the Internet (Johnson 2010).

Even so, in 2010, users of e-commerce in Saudi Arabia spent approximately US\$3 billion on transactions relating to goods and services through e-commerce. Furthermore, it has been identified that in Saudi Arabia, the e-information technology sector is growing at a rate of 9.3 per cent annually (Al Rasheed and Mirza 2011). There was an increase in the number of users who could access the Internet over the five-year period from 2009 to 2014, from 27.1 per cent to 65.9 per cent. See Table 2.3.



**Table 2.1. Internet Growth and Population Statistics**

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*Source: Internet World Stat Website, 2015*

According to Assad (2006), consumerism has already spread to the Arab countries, and particularly to the Gulf States; this is as a result of an increase in national income and it has led to an increase in individual income, changing people's consumption. Al Rasheed and Mirza (2011) report that the KSA is ranked first in relation to the sale of personal computers in the Arab world.

In the KSA, the culture is based on long traditional principles and there is a belief that there are situations where prejudice may win over progress and innovation (Al-Maskari and Sanderson 2011). There are still examples where it has been argued that computer system technology should be evaluated in terms of higher operational efficiency and reduction of paper work (Kerr and Hiltz 2013). In developing countries like Saudi Arabia, public organisations find it difficult to challenge other private companies when attracting qualified personnel, because the authorities do not offer a competitive salary and also because of the limitations of resources, which are restricted by religion, laws, regulations and habits (Alshehri et al. 2012).

In Saudi Arabia, even qualified IT people are usually looking for attractive jobs that will give them a good salary, and better training and support (Al-Dmour et al. 2014). This affects government institutes because they pay less than private sector. Jobs with less opportunity will not be attractive. Therefore, IT evolution has progressed slowly in Saudi Arabia, affected by human factors. On the positive side, the country continues to invest in development. As has been mentioned before, there is a positive relationship between organisational performance and IT investments (Al-zharani 2011). On one

hand, it is clear that it is not only the money that is needed for successful IT development, but many factors can work together to achieve the common goal (ibid.).

Following modern global standards, international companies use technology in their operations to help them achieve their clients' requirements regardless of their geographical base. Difficulties in obtaining information about IT productivity in developing countries has been described by Bianchi (2001: 3124) as follows: "*almost all findings on IT productivity are based on data collected in developed countries*". It has been argued that investment in IT is a high priority, and fortunately Saudi Arabia's government is ready to increase their investment in IT by up to 40 per cent (Alateyah et al. 2013, Alshehri et al. 2012).

The financial aspect cannot guarantee success in IT implementation; it actually depends on the approach, training and mentality. However, as many research studies have shown, informational and technical improvement could be beneficial and will always bring profits in return.

Information technology is an important element of today's business environment. Many IT and IS professionals have used these terms interchangeably. An IS involves executing and reporting information that will support the decision-making process. On the other hand, Wiblen and Dery (2010) defined an IS as a set of ordered procedures that provide information to support decision making and control in the organisation. Thus, this suggests that an IS is the interaction of human beings with computer software and hardware to perform tasks in an organisation. An IS is crucial in today's business environment because of the high level of implementation of business concepts that drive competition and technological changes. The next section is on social influence and it will provide a detailed analysis of how users' perceptions about others may affect different functions in an organisation.

All that has been mentioned so far regarding HRM and IT innovation leads to the development of the next section of this thesis, which introduces the concept of national culture and subjective norms.

### **2.3. National Culture and Subjective norms**

Numerous researchers in the field of psychology have proposed different definitions of culture. These definitions of culture refer to the different aspects of culture and claim to improve meaningful understanding of culture. Ollie (1995) discusses more than 164 definitions of culture. Similarly, Hofstede gave the following definition of culture: “(culture is) a collective programming of the mind which distinguishes one group from another”; this is considered to be the most cited and authentic definition.

In many definitions of culture put forward by researchers in the field of psychology, the term ‘programming’ is recurrently found, which shows that culture is an acquired characteristic, but that it is also a continuous process of fitting into society. According to McSweeney (2002), culture includes:

- Learning values that may be dominant beliefs or attitudes
- Partaking of rituals done collectively as a society
- Modeling to suit heroes’ acts
- The understanding of symbols which may be legends, jargon, or myths, among many others.

Culture is influenced by family, religion, school, friends and many other sources that humans interact with on a daily basis. Therefore, for the purpose of this study, the following sections will provide a detailed explanation of Hofstede’s national culture models and subjective norm, in order to understand their impact on the adoption and use of HRIS.

#### **2.3.1 HOFSTEDE’S STUDY**

Hofstede (1997) conducted research that commenced in 1980. This research comprised 116,000 questionnaires, which had a good response rate of 60,000 people from over 50 countries worldwide. These questionnaires were administered to Hermes employees (the present-day IBM) over a period of eleven years, from 1967 to 1978. Hofstede provided a factor analysis of 32 questions in 40 countries from the data obtained. From the research on IBM employees, Hofstede came up with four bipolar dimensions (power distance, individualism/collectivism, uncertainty avoidance, and masculinity/femininity). The four bipolar dimensions of Hofstede became the basis of Hofstede’s characterisation of culture.

The salient features of Hofstede's model include: streamlining of compensation practices; budget control; guiding of entrepreneurial behaviour; conflict resolution; workgroup dynamics and performance; innovation; leadership; and participative management in the context of resolving cross-cultural issues (Michael, 1997; Smith, 1998). However, Hofstede (1993 cited in Mert et al., 2013) presented the model showing the five-cultural dimensions to explain cross-cultural differences, which include power distance, uncertainty avoidance, individualism and collectivism, masculinity and femininity, and long-term versus short-term orientation. In later models, (Hofstede, 2001; Hofstede et al., 2010) indulgence versus restraint was added to make six dimensions. The six-dimension model advanced by Hofstede has become the international benchmark for understanding cultural differences. The six dimensions of Hofstede's national cultural model are elaborated below.

### **1 Power Distance**

Hofstede described the power distance dimension as one in which the level of inequality in society is tolerated. The hierarchy at the workplace is a kind of the power distance discussed by Hofstede. The ranks of power distance are such that in countries scoring low on the power distance scale, inequality is accepted more than in countries scoring high on the power distance scale. Malaysia ranks low on the power distance scale, giving an indication of the large distance between ranks in Malaysian organisations. Low ranking countries and organisations communicate through the command chain rather than directly, as is the case with high ranking equals. Israel is at the high end of the power distance scale; in Israel there is no hierarchical bureaucracy, hence a worker can approach the boss directly and have a conversation (Jones, 2007; Mert et al., 2013; Zhao, 2013).

### **2 Individualism/Collectivism**

Hofstede described individualism as the possibility of an individual being able to work with others in a group or preferring to work alone. The level of individualism in a person denotes the degree of social integration. In nations where the initial culture has not been broken, there is a tendency to act in a collective manner. Countries/individuals who score low on the individualism scale tend to act singularly, whereas those with high scores on the IC index tend to work in groups. The USA measures the lowest on the IC

index, meaning that they prefer singular dealings and glory. The orientation of the USA comes from the cultural upbringing of children, who are encouraged to be independent and to work for their own good. On the other extreme of the IC index is Guatemala. Guatemalan inhabitants work in groups and their achievement is ascribed to the group. Guatemalan people exhibit strong family ties and communal support for each other (Jones, 2007; Mert et al., 2013; Zhao, 2013).

### **3 Masculinity/Femininity**

One may think that the masculinity and femininity index of Hofstede refers to the dominance of gender. However, the masculinity index refers to the extent to which masculinity traits such as authority, assertiveness, performance and success are preferred over what society considers to be female traits such as personal relationships, quality of life, service and welfare. Countries/individuals with low rankings on the masculinity/femininity index lean towards the male characteristics, while high-ranking countries/individuals are likely to spend time building relationships and showing empathy as a female would. Japan ranks the lowest on this index, and is thus likely to be domineering. On the other extreme end of the masculinity index is Sweden and Norway. Inhabitants of either of these countries are likely to show empathy for their fellow workmates and to spend time on family bonding (Jones, 2007; Mert et al., 2013; Zhao, 2013).

### **4 Uncertainty Avoidance**

Uncertainty avoidance refers to the extent to which people are prepared to meet the unexpected, i.e. planned events or events that have just occurred, and whether or not they like to follow guidelines on what to next. UA is the extent to which society is affected by the absence of guidelines/rules or by undefined events. Low UA indicates the need to have a well laid-out structure and guidelines to help one wade through any circumstances, whereas high UA indicates the innate preparedness to tackle any situation that may arise. The Greeks have a low UA ranking, hence they require well-structured guidelines to aid with the execution of their duties. Swedes on the other hand have a high UA ranking and can work without structures and guidelines, showing a high preparedness for ambiguity (Jones, 2007; Mert et al., 2013; Zhao, 2013).

## **5 Short-term versus long-term orientation**

This dimension refers to the preparedness of the members of the society to accept the delayed satisfaction of their material, social and emotional needs. Short-term orientation stresses short-term goals associated with traditions and values linked with the past and present. Long-term orientation is related to career goals and is oriented to the future rather than to the past or the present (Jones, 2007; Mert et al., 2013; Zhao, 2013).

## **6 Indulgence versus restraint**

This dimension refers to the freedom of social members to indulge their own drives to have fun and entertainment. The societies that are more oriented to giving freedom to their social members to enjoy their lives are described as indulgence-oriented societies, which is the common trend in Western and American culture. However, the societies that do not allow this freedom are restraint-oriented societies. In such societies, the social and governmental agencies hold a tight control on the appearance or disappearance of human drives (Jones, 2007; Mert et al., 2013; Zhao, 2013).

Hofstede's national culture model has relevance, accuracy and rigour for pinpointing cross-cultural differences (Jones, 2007). However, this model has been subject to criticism from its antagonists. For instance, Venaik and Brewer (2013) argue that the power distance dimension is not found at the individual or organisational level. Similarly, another researcher criticised the fact that Hofstede defined national culture with the assumption of cultural homogeneity and a one-company approach, which restricts the application of this model and makes it difficult to apply to nations having different fragments of ethnicities and a variety of organisational setups (Mert et al., 2013; Zhao, 2013). Many other researchers have challenged the statistical and methodological approaches assumed by Hofstede in his national cultural model.

The next section will present another model presented by Trompenaars and Hampden-Turner which consider both human elements, external and internal environmental factors which can cause the differences in cultures.

### **2.3.2 Trompenaars' Model of National Culture Differences:**

The national culture differences model was developed by Trompenaars and Hampden-Turner after conducting a survey of 8841 managers and employees from 43 countries. The Trompenaars' model of national culture differences consists of seven orientations: universalism versus particularism, individualism versus communitarianism, neutral versus emotional, specific versus diffuse, achievement versus ascription, sequence versus synchronic and internal versus external control (Trompenaars and Hampden-Turner, 2004; Hampden-Turner and Trompenaars, 2008; Taras, 2015).

### **1 Universalism versus particularism**

Universalism refers to the belief that practices and values can be applied everywhere, whereas particularism denotes a culture that favours the idea that beliefs and practices can be applied differentially. Thus the authors suggest that a particularism-oriented culture uses practices and beliefs based on circumstances and situations (Trompenaars and Hampden-Turner, 2004; Hampden-Turner and Trompenaars, 2008; Taras, 2015).

### **2 Individualism versus communitarianism**

An individualism-oriented culture respects the freedom, beliefs, and ideas of individuals within the society, while a communitarianism-oriented culture treats individuals in groups. Therefore, the preferences of individuals are affected by the beliefs and ideologies of the people surrounding them (Trompenaars and Hampden-Turner, 2004; Hampden-Turner and Trompenaars, 2008; Taras, 2015).

### **3 Neutral versus emotional**

A neutral-oriented culture refers to a culture in which individuals restrain their emotions, while an emotional-oriented culture represents a culture in which the emotions of the individuals are freely expressed and exchanged between each other. Normally, individuals within an emotional culture speak loudly, and smile and exchange greetings with warmth and excitement (Trompenaars and Hampden-Turner, 2004; Hampden-Turner and Trompenaars, 2008; Taras, 2015).

### **4 Specific versus diffuse**

A specific-oriented culture makes a separation between private and public spaces. The individuals practising specific culture treat their private spaces with greater care in order to avoid any embarrassment in the public space. A diffuse-oriented culture

diffuses the public and private spaces together. This means that whatever beliefs are held in the private space are also shared in the public space (Trompenaars and Hampden-Turner, 2004; Hampden-Turner and Trompenaars, 2008; Taras, 2015).

## **5 Achievement versus ascription**

An achievement-oriented culture bestows success and status on individuals based on their achievements. However, an ascription culture gives respect and status to individuals based on what and who they are (Trompenaars and Hampden-Turner, 2004; Hampden-Turner and Trompenaars, 2008; Taras, 2015).

## **6 Sequence versus synchronic**

In a sequence-oriented culture, individuals tend to perform tasks in sequence, while a synchronic culture represents individuals who perform multiple tasks at once (Trompenaars and Hampden-Turner, 2004; Hampden-Turner and Trompenaars, 2008; Taras, 2015).

## **7 Internal versus external control**

An internal-control oriented culture has its own internal control which carefully monitors the practices and beliefs of individuals. Nevertheless, an external control-oriented culture is influenced by beliefs and practices from foreign cultures (Trompenaars and Hampden-Turner, 2004; Hampden-Turner and Trompenaars, 2008; Taras, 2015).

### **2.3.3 Subjective Norms**

Subjective norms refer to the personal perception developed by an individual of the social normative pressures. Normative pressures may be those created by family, peers, friends and beliefs (Fishbein & Ajzen, 1975; Deng and Kam, 2015). Social influence determines the perception held by an individual of what people who matter to him/her think his/her behaviour should be like (Fishbein & Ajzen, 1975). A normative belief is primarily the action taken by people or a group who take into account whether a certain person/people would agree or disagree with the performance of this action (Ajzen, 1991). Subjective norms have been identified as being linked to noticeable control beliefs in relation to conduct. Subjective norms have been justified by actions that



people have performed, believing that people important to them will approve of their dealings.

Taylor and Todd (1995) assert that normative belief is a singular perception, which is influenced by the judgement of significant others. George (2004) and Yau and Ho (2015) also assert in favour of Taylor and Todd (1995) that a belief about subjective norms and social pressure concerning purchasing would have a positive influence on the intention of consumers to make an online purchase. Furthering the definition of normative beliefs, Chang et al. (2009) describe the subjective norm as that which positively predicts information-seeking intention, and it has been established that subjective norms have a positive influence on intention when purchasing food online. However, all the research conducted on subjective norms and their relation to the purchase of items online is not conclusive. Research has been conducted to the contrary, asserting that the intention to purchase online is affected by a combination of past experiences and attitude, and subjective norms may have little to no impact on online purchases (Huang et al., 2011).

Subjective norms are normally referred to as the Theory of Planned Behaviour, developed by Icek Ajzen and Martin Fishbein in the late 1980's. The Theory of Planned Behaviour was coined from the Theory of Reasoned Action developed in 1967 (Delorme & Arcand, 2009). As early as 1862, psychologists began developing theories to show how attitude impacts on behaviour. Theories developed in the period between 1918 and 1925 suggested that attitudes could be used to explain human behaviour (Delorme & Arcand, 2009). The subjective theory was developed purposely to predict and understand the behaviour of people under someone's influence. Secondly, the theory identifies how and where to target strategies for changing behaviour (Delorme & Arcand, 2009). The Theory of Anticipated Action explains human behaviour in many dimensions, such as why people buy new cars, drop out of school or choose to study a certain course.

The two theories developed by Hofstede and Ajzen have fundamental differences in terms of positioning their subjects (individuals). Both theories are centred on humans and their relation to society. Culture dimension theories place their subjects at the work place when applying the theories (McSweeney, 2002), whereas the subjective norms theory applies to the individual no matter where he/she is. The culture dimensions theory, which studies the behaviour of people, is dependent on the Theory of Planned Action, which studies why people act like they do. The Theory of Planned Action helps

one learn how to change the behaviour of people, while culture dimensions study the mental programming of an individual (McSweeney, 2002). The Theory of Planned Action seeks to solve the problems that are inherent in society as outlined in the culture dimension theory. For example looking at the power distance index of Hofstede, there is difficulty in communication in organisations with low ranks of the power index; the Theory of Planned Action seeks, among many agendas, to provide useful information for the development of communication strategies.

Culture is the collective programming of a human grouping (Mert et al., 2013). The programming of humans in organisations and gatherings varies along the six cultural models advanced by Hofstede (Delorme & Arcand, 2009). The impacts of cultural dimensions are consistent and distinct when the behaviour is less discursive. When the choice of actions is restricted, the effects of diverse personal behaviours are restrained, hence the coming into play of collective characteristics as advanced by cultural dimension theories.

The basics of HRIS are to acquire, store, manipulate, analyse, retrieve and distribute pertinent information concerning human resources in an organisation. In the public sector of Saudi Arabia, HRIS has been adopted, but is not fully functioning as its architects projected; it is used to execute basic human resource officer duties (Altarawneh & Al-Shqairat, 2010). HRIS is not only meant to automate human resource activities in order to gain administrative advantages, but it is also intended to be used in decision making and the provision of strategic advantages in organisations.

Barriers to the implementation of HRIS include insufficient financial support, difficulty in changing an organisation's culture, and lack of commitment from the managers. Cultural impediments affect the way people think, act and behave towards HRIS, making the disbursement of resources for implementation difficult (Altarawneh & Al-Shqairat, 2010). The rigidity or flexibility of managers to adopt new human resource techniques is dependent on the subjective norm in an organisation (Mert et al., 2013).

## **2.4 Human Resource Information Systems**

### **2.4.1 Overview**

Human resource information system refers to a system that enables the organisation, through the HR Department, to keep track of all the employees and their information. This is usually done through a series of interrelated databases (Al-Mobaideen et al.

2013). This is the most recent in the progression of functionally oriented information systems (Hendrickson 2003) and it further reflects the trend towards end user computing. It encompasses a broad range of computer-based systems. Human resource information systems started in the 1960s and 70s as firms were converting their personnel records to softcopies for computer storage. The availability of mainframe computers that were located in the companies' information system departments quickened the process of information transfer (Ball 2001).

The components of HRIS entail data collection and report generation. Data collection entails payroll and benefits, performance appraisal, training and development, recruitment and selection, employment and job data. The activities of managers involve receiving information, communicating and using the same information in various affairs of the organisation. Since information is the basis of most activities within the organisation, there should be systems to generate and manage data. These systems should have the capability of producing reliable information that is easily usable (Solomon et al. 2013).

### **2.5.1 Definition of a Human Resource Information System (HRIS)**

Broderick and Boudreau (1991: 485) defined HRIS in this way: "the composite of databases, computer applications, and hardware, and software necessary to collect/record, store, manage and manipulate data for human resources." Later on, HRIS was defined as a system "which is used to acquire, store, manipulate, analyse, retrieve, and distribute information about an organisation's human resources" (Kovach and Cathcart 1999: 275). A similar definition of HRIS has been put forward by Hendrickson (2003: 382): "integrated systems used to gather, store and analyse information regarding an organisation's human resources" (Hendrickson, 2003: 382). Thus, it can be observed that HRIS includes different aspects of computers and technology being used for the functions of human resources in different contexts and in various organisations. Hedrickson further stresses that HRIS is not just limited to computer and related software applications, and broadens the definition of HRIS by commenting that a "HRIS is not limited to the computer hardware and software applications that comprise the technical part of the system: It also includes the people, policies, procedures and data required to manage the HR function" (Hedrickson 2003:

382). HR and IS are being used as composite systems that develop current and accurate information for decision making and monitoring, in which staff information is maintained, along with storage of data on salaries and wages, staff entitlement and a profile for the purpose of privacy in an organisation (Wiblen, Grant and Dery 2010).

This definition was further supported by emphasising that the IS in HRM performs critical functions, such as collecting, storing, analysing, maintaining and retrieving data about an employee. In other words, an IS in HRM is a structured technique of collecting, storing and giving information to managers for the purpose of decision making within the management and for progress towards achieving the goals and objectives of the organisation (Obeidat 2013). The information must always be up-to-date, valid, accurate and accessible to managers so as to facilitate those making vital decisions on management and the allocation of human resources.

### **2.5.2 History of Human Resource Information Systems**

HRIS does not have a long history; it has been reported that the role of HR personnel during World War II was just to keep records of employees, but they used to have a limited amount of interaction with business policies and the mission of the organisation. Their main function was restricted to keeping records of employees' addresses, names and employee history, scribbled and stored on writing pads (Anitha and Aruna 2014). Between 1945 and 1960, organisations developed a deeper understanding of employees and recognised them as human capital assets of the organisation. They subsequently developed an organised and formal process of recruitment and selection of employees for the key tasks in the organisation. Simultaneously, the concept of employees' involvement in the organisational success and their effectiveness for an organisational competitive advantage were recognised by the stakeholders of the businesses. However, during this period, no significant developments and changes occurred in the HRIS domain. HRIS was only used to perform descriptive and diagnostic tasks, but these lacked the ability to predict and prescribe information (Ostermann, Staudinger and Staudinger 2008).

During the 1960–1980 period, HR functions were streamlined with the incorporation of sophisticated components, such as the social and welfare development of employees and programmes to fulfil the skills and training needs of employees. This resulted in the inclusion of HR personnel in running training programs and setting standards for

employees' performance in order to achieve business success (Totty 2001). The governmental and regulatory criteria demanded an enhanced level of record keeping and the maintenance of employee history in the organisation, which led to the widespread application of computers and technology for analytical purposes and data storage. With the growing role of HR in the management of businesses employees' training and recruitment, the personnel in HR Departments utilised computing applications for transacting their day-to-day business. Although the use of computers and technology grew extensively during this period, they remained as mere tools and systems for record keeping and report preparation in a dynamic business environment (Ball, 2001).

During the period 1980–1990, the use of computers was extrapolated to cover some important tasks of HRM, such as the automation of payroll and the smooth operation of administration activities, which mainly resulted from the availability of easy-to-install, flexible, generic and customisable Microsoft Windows computer programs. The advent of new technologies not only made the function of HRM sophisticated, but it also increased the reporting capabilities of HR Departments (Ball 2001). In 1990, management involved HR personnel in the strategic management of business and realised that computer-based data storage and reporting tools could enhance employee retention and the preservation of other vital assets (Totty 2001). Moreover, HRIS had evolved more complex IS tools to support decision making (Ostermann, Staudinger and Staudinger 2008). During this period, HRIS continued to change the face of the HR function by providing assistance in administrative tasks, such as payroll and attendance management (Ahmad and Schroeder 2003).

The application of computers by HR Departments in universities has flourished since 1980, with more fervent growth observed between 1990 and 2000. As with other business-oriented applications, HRIS is involved in all aspects of strategic planning and management, such as recruitment and selection of staff, including teaching and non-teaching members of staff, advertisement and even the attraction of students from around the globe. At the beginning of the 21st century, due to cheaper IS software and hardware components, HRIS has emerged as a vital strategic component of the business mission of higher education institutions all over the world (Al-Tarawneh and Shqairat 2010, Ensouri 2014).

Therefore, the following section will analyse HRIS adoption in detail for accomplishing HRM practices in various organisational contexts. Today, HRIS is used to facilitate recruitment processes and strategic decision making (Alshibly,2014). Not only does HRIS help in administrative activities, but it also helps in the HR planning process and in planning future workforce requirements (Dessler et al. 1969). In today's advanced and complex business environment, HRIS helps to support long-term planning, supply and demand forecasts, staffing, information on training programs, salary forecasts, budget information on contract negotiations and employee assistance needs (Malinowski et al. 2008). This suggests that HRIS has not only become a planning tool, but also a system that helps the top management team to make strategic decisions to beat the competition.

### **2.5.3 The Structure and Functions of Human Resource Management Information Systems**

HRIS consists of all the software applications that are normally applied to track and store data regarding employees, their activities and their productivity. It enables managers to better utilise the human capital within an organisation (Harry, 2006). A company can practically buy any software solution that is able to fulfil the basic needs of data storage and data retrieval. However, these simple solutions cannot be categorised under the umbrella of HRIS, which involves a complex and highly sophisticated set of software applications containing various integrated modules to complement the different functions of HRM (Vosburgh 2007). The systems that are fully integrated and designed to be integrated with the expertise and functionalities of HRM are able to reproduce positive outcomes for an organisation. Their main functions are related to data analysis, data manipulation, and dissemination of information.

Various organisations, such as universities, manufacturing and service firms, have different data handling and storage needs; therefore, based on these needs, software developers have created unique solutions for different types of companies (Schuler and Jackson 1998). They can be divided into two main groups. The first group contains highly sophisticated modules and is designed for single complex tasks. This represents the enterprise resource planning (ERP) systems, which are required for the integration of processes and information from the operational and financial aspects of the organisation (supply chain management, manufacturing units, customer relationship

management, etc). The second software group includes a collection of various software applications dedicated to the computerisation of HRM functions, and it contains modules that are integral to the respective HRM tasks. These systems are simple and partially designed solutions for small companies that do not require complex solutions with layers of multiple modules. Both groups contain integral software packages, which are necessary for the HRIS of a single organisation (Kovach et al. 1999). According to Roberts (1999), most of the systems contain the software packages listed below.

## **2.6 Applications Monitoring and Collection**

HRIS is designed to allow applicants to apply for certain jobs advertised through HR Departments. The HRM employee can receive, process and monitor the application through this HRIS module, which requires access to the Internet and a computer to accomplish the specified tasks. This method is found in almost all online application processes of companies in the developed world. This software package facilitates the next phases of application, such as interviews, evaluations, selection, and finally the generation of reports based on the labour market. Also, candidates are provided with the option of application tracking and changing their profile through this software package.

### **2.6.1 Record Keeping**

HRIS performs a record-keeping function. In this HRIS system, applicants' information and employees' data can be stored, retrieved and added to whenever the need arises. For example, if a HRM employee is asked to provide information on the academic documents of an applicant or employee, then he or she can quickly and efficiently search for this information in the data directory which contains details of thousands of employees (Kovach and Cathcart 1999). This module necessarily holds the following types of data about the employees: wage history, emergency and regular contact details, education records, training and certificates, disciplinary actions, injuries or illness data, and so forth.

### **2.6.2 Payroll System**

This software package calculates the time and days of the employees at work, tracks their absence reports, prepares tax reports, and finally generates salary slips for each employee after regular deductions in an automated manner. This HRIS is also integrated into the financial management system of the organisation for the measurement of

employee performance and productivity, utilising input data regarding employees' absences, time spent at work and compliance with the regulatory framework of the company.

### **2.6.3 Benefits Administration**

This software maintains the records of all the employee benefit schemes offered by the company. It provides online access to employees about insurance policies, pension plans, health benefits, the distribution of company shares and dividend shares. This fulfils the regulatory duty of the company to keep all of its employees aware of their rights and benefits.

### **2.6.4 Training Software Package**

This is a very important HRIS module which provides the following services to HRM personnel: the storage of employees' educational certificates, assessments of deficiencies in training and learning, predictions of deficiencies, and suggestions for training courses for individual employees based on their skills needs. Also, this module contains online access to books and course materials for employees. This allows the company to save a great deal of money and time in terms of delivering online courses and course material quickly for individual learning. This module can be bought separately on the software market.

### **2.6.5 Performance Management**

Performance management is a critical process that allows a company to evaluate the effectiveness of the existing HRIS software and solutions being used for data handling. This monitors the performances of different software and systems being used as a part of HRIS. This allows the company's management to make decisions on upgrades or updates of the existing HRIS.

### **2.6.6 Employee Self-Service**

This HRIS is helpful in managing the employee database and keeping it up-to-date. It normally works with an Internet browser, such as Firefox, Chrome or Internet Explorer, through which employees can access their data online, change their personal information and check their monthly or annual performance statistics.



## **2.7 Potential Benefits of HRIS**

There are many proven practical reasons why HRIS was created and quickly gained strong supporters and loyal and devoted promoters. The system has therefore become very important in organisations, institutions and companies. When comparing pre-HRIS and post-HRIS periods, it can be seen that there is a great difference between the two (Teao, Soon and Fedric 2001).

Historically, HRIS has been seen as a necessary tool in the hiring, administration and separation of employees. Over the years, these processes have not changed dramatically, but the way the information is gathered and stored has (Townsend and Bennett 2003).

Human resource management is critical in a knowledge-based economy where expertise and ideas are valued, and a creative workforce is needed to meet the challenges of the growing economy. Effective management of human capital is progressively becoming an imperative process. As a result, there has been an increase in the number of firms collecting, analysing and storing information on their employees with the use of HRIS (Tixier 2004). The growing importance of this system is due to the fact that there is recognition of IT and IS within HR Departments.

The potential benefits of an HRIS include faster information processing, more accurate information generation, planning improvement, better development of the program and improved communication with employees, which as a whole yields a more efficient service delivery (Overnman 1992). Some authors suggested that HRIS could be beneficial to HR by automating information and reducing the large number of HR employees required for managing the HRM functions (Ankrah and Sokro 2012, Lundy 1994, Gable et al. 2008). They further argue that managers can easily access relevant information and data, which can be used for analysis, thus facilitating the decision-making process. It also helps with communicating with other consultants under the umbrella of HR professionals (Al-dmour and Al-zu'bi 2014). HRIS has revolutionised the implementation of HRM practices in terms of reducing the number of people needed to handle tasks such as collecting and storing information, inputting data, data processing, and performing administrative duties such as record keeping. Some authors suggest that the benefits include helping to improve value to shareholders (Brown 2002).

There are issues reported regarding the measurement of the benefits of HRIS to HR practices. For example, there are few clear ways of supporting some information, such as cost reduction and time management. It is also difficult to measure some HRIS-induced developments, such as return on investment (ROI) or significant improvement in the productivity of the department or the organisation as a whole (Mayfield and Lunce, 2003). According to Pynes (2008: 56), HR Departments within organisations are required to show their value. To this end, HRIS and HR audits are carried out to assess the data on HR performance. After assessing performance, a comparison is made with the standard parameters of performance set for individual organisations to measure the ROI. The use of one HRIS application, called HR analytics, is recommended by many scholars to determine the cost of employees, which generally lies in the range of 50-80 per cent of the total expenses borne by an organisation. Through this data, HR leaders try to determine the connections between progressive HR practices and agency performance, which in return gives a measure of the return on investment (Chauhan et al. 2011). Similarly, Straner (ND) stated,

*'ROI is critical. Research shows that companies are 44 percent more likely to estimate ROI to cost justify enterprise-resource-planning projects than they were only two years ago. In addition, best-in-class performance comes from measuring ROI: the best companies have 33 percent more aggressive plans but are 150 percent more likely to meet expectations of ROI', (Starner, p. 4).*

The rationale for the potential benefit of HRIS varies from organisation to organisation, depending on the nature of the functions and tasks carried out (Al-Dmour and Al-Zu'b, 2014). In some private organisations, such as banking, it helps to reduce costs, and fosters orientation improvement for others (Al-shawabkeh, 2015). For some organisations such as universities, it assists in achieving the goal of better communication between departments and contributes to the achievement of streamlined strategies (Parry et al. 2007, Al-Tarawneh, and Shqairat, 2010). Laderer (1984) reiterated that a computerised HRIS system enables a team to perform faster in terms of the decision-making process, planning, and the administration and development of functional data for storing, analysing, retrieving and updating. Berry (1993: P297) summarised five reasons that organisations should use HRIS: (1) "to create greater numbers and diversity; (2) to increase competitiveness by improving HRM practices;

(3) to motivate employees and make them part of HRIS; (4) to transfer the focus of HRM from the processing of a transaction to strategic HRM and (5) to re-engineer the HRIS rules and policies”.

In large organisations, departments harmonise teamwork to enhance HRIS by using simple spreadsheets or more complex calculations, and the outcomes of these tasks could have a positive effect on the organisation. The calculations can be based on employee benefits, such as wages and commissions, healthcare system costs, operating costs, turnover rates and the return on the organisation’s human capital investment (DeSanctis 1986).

Human resource information systems have ensured increased performance within organisations (Buck et al. 2003). The most important development in the HRIS sector lies in the use of the companies’ intranets as a means of managing most aspects of HRIS. The availability of microcomputers and user-friendly software implies that HR managers no longer need to depend on IS experts to advance and implement applications.

The invention of HRIS has resulted in further inventions of specialised applications to supplement HRIS. These specialised applications aid in sectors such as benefits administration, succession planning, applicant tracking and employee performance assessment. Human resource information systems have made it possible to provide comprehensive information to organisations, thus enabling them to provide structural connectivity across units and the activities of their employees, and to maintain the highest level of communication and co-operation (Barron et al. 2004).

The other positive aspect of HRIS may be seen in the increased competitiveness and management processes. In addition to improving the operations of the HR Department, it has revolutionised the collection of relevant data and its conversion to information that can improve the quality of decision making. The system has also ensured that there is employee satisfaction by delivering HR services quickly (Bussler and Davis 2001).

Human resource information systems have made it easier for HR to hire qualified personnel. Hiring is the final step in the recruitment process. Recruiting new members into the organisation is the most critical activity of the HR Department. When the department has an effective recruitment strategy, the candidates being recruited will be

of high quality which is of vital importance, especially in developing countries, which need to ensure the high standards of their employees in order to continue to progress. It can also serve as a valuable way to maintain employee satisfaction and personal development in order to achieve the best workforce potential, and also its loyalty and commitment. Human resource information systems have also improved communication between the HR Department and other departments (Al-Tarawneh and Shqairat 2010, Ankrah and Sokro 2012). This has facilitated effective decision making and increased competitive advantage for the organisations using the system.

Most organisations that employ a very large number of people should have a well-established HRIS (Anitha and Aruna 2014). This ensures that the employees' database is developed to handle personnel issues. This system brings companies with many branches together. A company that is geographically dispersed requires information instantly and accurately. This system ensures that the conditions of accessing information are fulfilled, since any employer can access the information from anywhere because they are connected using the extranet and intranet.

Human resource information systems help employers to managing training needs, thus allowing them to coordinate both required and optional training (Al-dmour and al-Zu'bi 2014). For instance, when employees require a certain training program for their personal learning, they should go to the HRIS. If the training is available, that particular employee will be notified by the system. Therefore, the HRIS helps the management by automatically managing the fulfilment of training needs.

During the pre-HRIS era, most organisations were handling everything manually, which was tedious, expensive and time-consuming. This was eased with the introduction of HRIS, which ensured that these organisations kept up with the changing trends in technology. Applications such as clerical applications and training management allowed the company to reduce its costs, since most of the operations were digitalised. Furthermore, updating the information is easy since it can be done on an hourly, weekly, monthly or yearly basis (Fitz-enz 1998).

Another advantage of HRIS is the fact that it has a pay schedule section that reduces the amount of work of the HR staff. As a result, the process of paying the labourers has been simplified, thus reducing human miscalculations.

From all that has been mentioned above it is clear that HRIS is characterised by three main components: employee information, benefits and payroll. These are the main business functions of the organisation's HR Department (Totty 2001). Since basic human resource processes are automated, and all information stored in the databases is connected, HRIS simplifies reporting and supports decision-making activities. Most HR applications will allow users to establish ad hoc reports in order to analyse specific issues to help management plan strategically. Depending on how complicated a system is, HRIS allows for data sharing and integration with other important business systems such as supply chain management and finance (Teatia 2012).

Additionally, some systems will provide network connections to the workers' health insurance carriers, retirement and fund administrators. This allows employers and insurance carriers to share employee information easily. Since HRIS links the HR Department with managers and employees, the employees can enter the hours spent at the workplace, and enroll into benefit programs and available education courses as they communicate with the HR Department.

HR professionals and IT experts both use IT or the HRIS to guide them in their organisational activities and in the decision-making process; for instance, the manufacturing and service industries rely heavily on data collected through HRIS to make strategic decisions (Sabherwal et al. 2006). IT or IS have become a very important resource in organisations because they enable companies to improve efficiency, save costs, and gain a competitive advantage (Caldeira and Ward 2002, Legris, Ingham and Collette 2003).

Therefore, many organisations invest huge sums of money in IS adoption to enable them to provide better products and services and to gain a competitive advantage (Twati & Gammack 2006). However, adopting an IS comes with its associated challenges, such as redesigning employee work schedules, high infrastructure costs, and the associated high cost of training employees with different cultural allegiances (Twati & Gammack 2006). Many researchers have conducted studies to understand IS adoption and implementation in the HR Departments of different organisations (Landrum and Prybutok 2004, Huh, Kim and Law 2009, Petter and McLean 2009, Trivellas and Santouridis 2012). Huh, Kim and Law (2009) investigated the intentions of hotel employees in South Korea to adopt an IS, while Trivellas and Santouridis (2012)

investigated the impact of a management IS (MIS) and its effectiveness on task productivity in the banking sector in Greece. They found that IS implementation in the banking sector had improved efficiency, innovativeness, goal setting and planning, mainly because of the quality of the information provided through the IS data collection tools for operations, processes and effective management of HR.

ISs are integrated into different disciplines of management and hence they are known by different terminologies, such as HRIS in HR, MIS in management, and ERP in the logistic and supply chain sectors. Nevertheless, the existence of ISs in these disciplines is intended to improve the functioning of organisations by bringing about a better decision-making process. IS adoption has provided different perspectives on how people with different cultural backgrounds define, observe and appreciate its success. For example, many organisations in the Mediterranean Arab regions have realised that the benefits of IS integration into management can be harnessed to improve their economies and the overall efficiency of their business competitiveness. Thus, they have invested substantial funds in IS adoption (Straub, Loch and Hill, 2003).

## **2.8 The Challenges of HRIS**

The integration of IS technology into management and HRM does not always come without side effects (Alsheha 2007). HRIS have raised some security issues. For instance, the data regarding employees and organisational affairs that is stored and saved in HRIS modules can be intercepted and accessed by malicious third parties (invisible) if security mechanisms are not fully applied. The problem is not only restricted to access of data by HR professionals, as the accessibility of information by employees, without controls and checks, can also be perceived as a great threat to the confidentiality of data (Seif 2015). The activities of certain users, such as developers, system analysts, end users and privileged users, must be monitored regularly. Privileged users having access to information should be watched, especially due to the possible threat of deletion, insertion or modification of data (Seif 2015).

Furthermore, encryption and login capabilities to watch over the audit trail (Accorsi 2009) are normally applied to secure the HRIS, which can be oriented towards securing networks and host security with the inclusion of firewalls and intrusion-sensing mechanisms that are built into HRIS modules. Similarly, the integration of an IS into

an organisational network may cause HRIS interference with other in-house IT functions of the organisation that are designed to share information seamlessly across different strata of the organisation. This raises an important security issue pertaining to the vulnerability of HRIS functions in the event of crosstalk with those systems, which are not secured fully within an organisation (Zafar 2013). Furthermore, the widespread and complex use of information processing and organisational personnel transactions with HRIS data puts both security and privacy at high risk. In the modern era, concern has been raised over underdeveloped HRIS in terms of securing data, which can be a cause of HRIS non-adoption by organisations in the developing world, particularly those that have less experience with dealing with such issues and implementing HRIS (Wong and Thite, 2009).

## **2.9 Adoption of Human Resource Information Systems in Saudi Arabia**

The history of HRIS in Saudi Arabia is very new in public sectors. The government allowed Internet access in 1998, and the concept of HRIS development in various organisational contexts is still novel. Research conducted on HRIS is very limited. However, researchers have conducted some studies to expose a few of the challenges faced by Saudi Arabian organisations connected with managing organisational resources due to poor HRM practices (Almalki et al. 2011, Khalifa 2013, Hasanain et al. 2014).

The research has demonstrated that IS tools are underdeveloped in Saudi Arabia and many Gulf States (Almalki et al. 2011). Almalki et al. (2011) reviewed the health care system in Saudi Arabia and concluded that many aspects of health care were being compromised due to the lack of IS implementation for recording and keeping histories of patients in the country's local health care systems. Though many medical and healthcare practices benefit from the use of health ISs and electronic medical records all over the world, the IS adoption rate in KSA is very poor due to the resistance offered by medical practitioners in Saudi Arabian hospitals (Khalifa 2013). According to his report, many barriers stand in the way of successful adoption of IS technology in hospitals, including technical barriers arising from the ignorance of staff, and professional barriers in terms of lack of knowledge about IS tools by medical professionals. Financial barriers also occur due to inadequate investments by governmental agencies in IS development, and organisational barriers are posed mainly

by management by not allowing the widespread use of computers and IT infrastructure within hospitals. Similar findings have been reported by a study conducted by Hasanain et al. (2014).

Alkahtani (1998) carried out research on oil companies and the banking sector and determined the level of computer-based IS usage in Saudi Arabia. He reported moderate use of IS practices by management in the oil and banking sector, and there were issues with making these practices effective in fostering an organisational competitive advantage. For example, issues relating to recruitment, the selection of employees and training of personnel seriously affected IS adoption and success within Saudi Arabian organisations.

Another study performed by Khoualdi and Basahel (2014) sought to determine the impact of system application products (SAP) implementation on the performance of a HR Department in a Saudi electricity company (SEC). They concluded that the implementation of the SAP system reduced paperwork and increased the data handling and transaction efficiency of the overall work performance of the HR Department of the company. However, they found some challenges faced by the company during the implementation, such as the employee satisfaction level and the amount of training required to use the SAP system. This clearly indicates that the SEC reaped benefits from the IS, but challenges are still there for Saudi organisations due to the lack of workforce training on IS tools.

Similarly, Al-Hudhaif (2010) measured the quality of IS services in manufacturing organisations in Riyadh, the capital of Saudi Arabia. The researchers highlighted that there was a low level of adoption of IS tools and a poor quality of IS services in manufacturing organisations. Furthermore, they found a low level of investment in IS tools and training of employees in using IS tools to achieve a higher level of productivity. The study also highlighted a large gap between the level of understanding of IS tools and their subsequent applications in Saudi manufacturing organisations. Ensouri (2014) conducted a study to analyse the impact of IS applications on the management and quality of services offered at the University of Tabuk. They revealed that the perceptions of the IS services and tools used by the HR employees were high, but the level of training and awareness of the usability of these services was poor. Their study further showed that improvement in the various dimensions of the IS services,



such as hardware, software, security, usability and the subsequent employee training in these areas, could lead to better usability and quality of services, and higher customer satisfaction as a whole.

Mellahi (2007) analysed the HRM practices in 26 firms in Saudi Arabia. He found a correlation between management practices and labour productivity. His study revealed that poor HRM practices across the selected firms were as a result of limited use of IT and IS resources, poor use of talented employees and the lack of proper training programs. The study indicated that a lack of integration of IS services and tools can lead to poor HRM performance and subsequently to low productivity. The antecedent studies on HRM and HRIS in Saudi Arabia were conducted on various firms across the spectrum of various industries and showed that HRIS use and adoption is poor, which is mainly due to poor investment, and the lack of training and integration programs for employees and HR personnel for using IS tools and services. Significantly, there is very meagre evidence in the literature about HRIS use and implementation in universities and higher education. Overall, the success factors for implementing HRIS tools in educational institutions are rather poorly explored. There is practically no research in the literature that can show the effectiveness of HRIS for a HEI in Saudi Arabia.

Al-Khowaiter et al. (2014) have conducted research in public sector organisations in Saudi Arabia to validate the HRIS model proposed by the authors. They developed their HRIS model by integrating three different IS models into one – the Unified Theory of Acceptance, the TAM model of technology adoption and the original Delone and McLean IS success. The authors used the social pressure construct to measure the intension of use, which means that the social pressure construct was used to measure the adoption of HRIS, instead of measuring its influence on the success of HRIS in public sector organisations. The successful adoption of HRIS, as defined by Delone and McLean, is the extent to which the HRIS contributes to the success of the stakeholders.

Therefore, Al-Khuwaiter and her colleagues focussed more on the adoption at user level rather than measuring the role of HRIS. In addition, another weakness of this study was the blind implementation of the proposed HRIS model in Saudi public organisations without taking the organisational socio-cultural differences into account. The three models used by the authors in the construction of a new model were derived from the

users' experiences with HRIS in the western culture. The socio-cultural factors of Saudi public organisations are totally different from those of western organisations.

Even the authors realised this gap in their methodology, and pointed to it in this way: "qualitative research method might be quite suitable for conducting such type of research. (However) A questionnaire survey will be used to examine the adoption and success of HRIS in the Saudi Ministry of Education" (Al-Khuwaiter et al., 2014, p. 20). This shows that the authors were aware of the fact that the best approach was to conduct a qualitative study first in order to gather the data from the HRIS users working in Saudi public sector organisations. This data would have been used to build up the model, and then to implement it in order to verify its effect on the adoption of HRIS. However, they only used a quantitative tool to validate the constructs of the proposed model.

This means that their study has missed out many social factors and users' experiences that might have been useful in building a new model to be implemented in the socio-cultural context of the public organisations in Saudi Arabia. Such a deep insight into users' experiences and the social factors affecting the use and success of new technologies in different cultures can only be gathered through a qualitative method. It can be argued that the findings reported by the proposed model of HRIS adoption may not depict the whole picture of the constructs and factors affecting this adoption. Although the word 'success', along with 'HRIS model' has been used in their study, there is no evidence in their research findings to show the impact of the adoption of HRIS on both individual and organisation for the users of HRIS in public organisations.

Therefore there is a need for the development of a comprehensive HRIS model involving the socio-cultural factors for public sector organisations in Saudi Arabia, which could be used to measure the success and use of HRIS in public sector organisations. The researchers have emphasised the measurement of success rather than adoption because HRIS technologies have been used in public and private sectors in Saudi Arabia for the last decade (Al-Mobaideen et al., 2013). This reflects the need to initiate the research endeavour to measure their success in terms of HRIS adoption to the stakeholders, rather than focusing on the intention to use or the simple adoption of HRIS in Saudi organisations (Khoualdi and Basahel, 2014).

The current research project has been designed uniquely in the sense that it aims to explore the people's experiences, perceptions and opinions directly interacting with

HRIS within HR departments of public universities in Saudi Arabia. In contrast to the study carried out by Al-Khuwaiter et al. (2014), this study intends to embed the constructs derived from the socio-cultural context of public universities rather than use the previous IS models developed in different contexts in other countries. Therefore, this study, unlike the Al-Khuwaiter study, used the mixed-method approach. The qualitative phase of this study enabled the researcher to find the dimensions/constructs affecting the success of HRIS in the context of public organisations in Saudi Arabia.

The extended Delone and McLean Model was used as a base or reference for the HRIS model as it is the model advocated and used by several other researchers to measure the success of HRIS in both public and private organisations (Al Shibli, 2011; Sshkan and Norshidah, 2013). The newly found construct, subjective norm, derived from the qualitative phase of this study was added to the D & M model to make it suitable and applicable to Saudi public universities. This study stands in contrast with the study of Al-Khuwaiter et al. (2014), which used the social pressure construct that was part of the 'Unified Theory of Acceptance' model in their HRIS model. Social pressures contrast in many ways with the 'subjective norm' construct which is found and incorporated by the current study into a newly developed HRIS model.

For instance, subjective norm refers to the belief about whether or not most people would approve or disapprove of the behaviour. It relates to the person's beliefs about whether peers and people of importance to the person think he or she should engage in the behaviour. On the other hand, social pressure refers to the customary codes of behaviour in a group or people in a larger cultural context (Yau and Ho, 2015; Deng and Kam, 2015). Ham et al. (2015) also differentiated subjective norm from social pressure. They argued that the former is related to the system of beliefs that either support or reject the certain behaviour or activity within a particular organisational context, while social pressures refer to a combination of social forces including manners, codes and symbols which force the person to behave in certain way in a larger cultural setting beyond the organisational context. Therefore, it can be argued that this study used the subjective norm construct as derived from the qualitative phase of this study, rather than social pressures as is done by Al-Khuwaiter et al. (2014).

In short, in contrast to Al-Khuwaiter et al.'s (2014) study, this study adopted the mixed-method approach, and extended the D&M HRIS success model by integrating the

subjective norm into the model to make it applicable. This enabled the researcher to determine the success of HRIS adoption in terms of importance and users' satisfaction for public universities in Saudi Arabia, and the model was more focussed on success than the adoption of HRIS. Of particular note, Al-Khuwaiter et al. (2014) did not develop a new model or extend any existing IS model to be applied to public organisations; instead they just integrated three IS models as described earlier. However, the current study extended the D&M HRIS success construct against the background of social factors (subjective norm) motivating or demotivating the use and subsequent importance of HRIS adoption. Consequently, it can be argued that this is the first study of its kind to develop a unique HRIS model which can be used to determine the success of HRIS in public organisations in Saudi Arabia.

Table: 2.2 The differences between the Al-Khuwaiter study and the current study

Differences	Current study	Al-Khuwaiter et al. (2014)	Comments
Title	An analysis of the adoption and use of HRIS in public universities in Saudi Arabia	Conceptual model for examining the adoption and success of HRIS in public sector organisations in Saudi Arabia	There are differences based on the use
The aim	To investigate the adoption and use of HRIS in the HR departments of Saudi public universities	To propose and discuss a conceptual model to identify the factors influencing success of the HRIS in public sector organisations in Saudi Arabia	There are differences based on the usage
Methodology	Mixed methods (qualitative and quantitative)	Quantitative survey	There are differences based on the research approach (qualitative and quantitative)
Model	Proposed the conceptual HRIS framework by integrating the novel dimension “subjective norm”, using the Delone and McLean IS model as a reference model	Proposing integrated conceptual HRIS framework by integrating the existing three models: the TAM model , D&M model, and the Unified Theory of Acceptance. Did not introduce any novel component based on Saudi culture	There are differences
Contribution	Novel HRIS conceptual framework with the addition of new dimension “subjective norm”. Introduced subjective norm based on the findings of the qualitative phase of this study.  Provided a HRIS model that can be applied to study HRIS	Validated integrated HRIS model without consideration of cultural outcomes on the use and adoption of HRIS.  Used the “social pressure” derived from the unified model of acceptance.	The difference between social pressure and subjective norm can be found in the above paragraphs

	implementation and effectiveness in HR departments of public sector organisations.	Did not undertake an exploratory study to introduce any dimension.	There are differences
Context	HR managers employees working in HR departments of the Saudi public universities as sample population.	Employees of Ministry of Education as sample population	There are differences

## 2.10 Human Resources metrics use and impact on HRIS

HRIS can be used to derive HR metrics (John and Bradley, 2015). These are measurements used to determine the effectiveness of human resource initiatives, such as training, cost of labour, etc. HRIS can also aid human capital management (Vij and Sharma, 2014). These are enterprise solutions that help companies put into action recruitment-to-retirement processes that are meant to help their businesses. HRIS is particularly distinct because it merges two distinct disciplines of human resources and information technology, while HRIS is a general term that refers to the use of computer technology within HR to conduct the routine functions of data handling.

According to John and Bradley (2015), the relationship that drives human resources decisions is the assumption that changing human resources often affects the financial performance of the firm .Human resource metrics are standard measurements used to determine the effectiveness of human resource initiatives such as training. It is of utmost importance that organisations are able to show the value of money and time spent on training. HR metrics are an important way of verifying the cost and the effect of employee programs and measuring the success or failure of initiatives. This is very important for HR as it is viewed as the leader in terms of recruiting, developing, and helping place talent (Boudreau, Lawler and Levenson, 2004). The metrics that can be collected in order to access HR efficiency include productivity and cost metrics. Organisations with good metrics make a good assessment of the performance of their HR function.

The impact of HR metrics can be realised through the following points (Rogers, 2012):

- Organisations with proper metrics are more likely to be a strategic partner than those without
- They help account for money and time. Metrics help to ensure that money allocated to particular activities is used well and that time management is also observed
- Ensures proper accountability for resources
- Measures performance of the company and ensures quality service provision. They help to ensure that the company has standards towards service performance

According to Dulebohn and Johnson (2013), HR metrics promote employee engagement and thus organisational effectiveness. Employees are the sole reason that organisations are running, therefore ensuring that they are well catered for it is a way of promoting an organisation to the next level. In order to achieve organisational effectiveness, the HR metrics should be aligned with corporate and business strategy (Rogers, 2012).

### **2.11 Human resource analytics use and impact on HRIS**

Human resource analytics is the field of analytics that involves applying analysis to human resource programmes (Rogers, 2012; Aral et al., 2012). It helps to improve employee performance, and thus company growth. When this process is applied, the business benefits by attaining a greater return on investment. It involves providing insight into the process of gathering data and making the relevant decisions based on the data collected. Basically, human resource analysis is used for the following: to acquire, optimise, develop, and pay the employees (Rogers, 2012). It is evident that the workforce determines how an organisation will operate. Many companies are turning to analytics to help them to make important decisions intelligently. Human resource analytics have impacted the industry by analysing employee talent, and anticipating employees training needs to help with planning the workforce (Lawler et al., 2004; Nita and Gurdeep, 2009). This also helps to identify the best avenue to source new recruits by analysing recruitment channels, and then hiring significantly qualified recruits to add value to the organisation. Human resource analytics are the way to achieve high performance in an organisation and ensure that the service provision is top-notch (Aral et al., 2012).

## **2.12 Human capital management use and impact**

According to Vij and Sharma (2014), human capital management is a modern approach to staffing. It views the staff as an asset whose value can be measured and increased through investment. It is basically the collective skills and expertise of the staff that play an important part in running a company. The employees are the backbone of a company; without them the company does not exist. Human capital management involves training and maintaining the staff in order to achieve a good performance. It is essential for hiring, maintaining, and training staff. The recruitment process is wholly reliant on this concept. It is important to hire someone who is highly skilled and who will add value to your organisation. The system also helps to orient new recruits to the organisation. It is important to add information that helps the organisation to cope with the ever-changing society. It plays an integral role in facilitating the smooth functioning of HR processes, such as staff recruitment.

Human capital management helps to improve the workforce. It offers training and also takes measures to help safeguard the high-quality performance of employees, thus ensuring that the organisation has a well-trained workforce (Edward, Alec, and John, n.d.). In addition, human capital management aids with making a rather stressful recruitment process easier to manage by singling out those outstandingly skilled candidates who would be a great addition to the team. It helps with orienting new recruits; it is very old school and tiring to hand tons of information to new recruits in the form of orientation; human capital management offers a better alternative.

According to James and Richard (n.d.), HRIS offers an amazing solution to everyday problems in the human resources field. It provides a necessary innovation that makes the running of human resource functions more efficient and effective. The three analyses, human resources metrics, human resources analytics and human capital management, are all dependent on HRIS software that is being used across the universities in Saudi Arabia.

Universities have revolutionised and embraced the use of this system, because of the system's advantages and the lowering of input costs that it brings. After the incorporation of the system, depending on the size of the institution, one needs to scrutinise the progress of the software package, and the efficiency and effectiveness of the system. Apart from just scrutinising the system, the analysis sets out to research the returns that the system is bringing to the institution. Now that human capital is the fuel



of these institutions and the basic tool for their success, periodic scrutiny is very healthy: when to hire, when to lay off, when to do training, when to change management, check payrolls, and so on. These are the changes that are crucial to human resources in these institutions and the analytical parameters are important to the HRIS.

Therefore, the next section explores the previous HRIS theoretical models and subsequently develops a conceptual framework for the current research work.

### **2.13 Theories/Models Applied to HRIS Adoption, Use and Success**

From the above analysis there should be no doubt that HRIS are essential components in the development of any institution or organisation. Therefore, the assumption could be made that in the higher education sector they should be regarded as an integral part of progress and innovation. Following the thought of Hendrickson (2003), the management of information is essential to the modern HR function in any organisation, yet to date there has been relatively few research studies on HRIS adoption (Hendrickson and Mahnke 2005, Blount and Castleman 2009).

What is more, the studies that have been undertaken investigated the phenomenon taking into consideration differing variables: organisational size, HRIS expertise, distinctive competition and characteristics, and top management support. Others have taken certain framework models of technology adoption such as Diffusion of Innovations (DOI) (Teo et al. 2007) and Technology-Organisation-Environment (Troshani et al. 2010/2011).

The judgement of the success or failure of the practical implementation of HRIS may vary (Sadiq et al. 2012). It often depends on which variable is taken into consideration and from which perspective it is judged. As in many cases there can be employee-management conflict, this may result in different outcomes that can be easily explained and justified (Al-Qatawneh et al. 2012).

What also causes difficulties is the fact that, despite the general opinion that it is successful, there is no recognised foundation that specifically identifies the important features of an effective system. So there is no pattern that could serve as a framework to describe the successfulness of HRIS (Alshaliby 2011). That may be a significant reason why enough studies which tried to assess whether the implementation of HRIS has been successful or not. As there is no template to follow, there is no basis to measure

users' and deliverers' satisfaction. Without being able to supply specific research tools, many studies have followed standard theories and models of IS triumph as a tool through which the HRIS success can be cautiously measured.

The majority of the studies based their research project on commonly established D&M IS success models (Ramezan 2010, Alshaliby 2011, Bal et al. 2012). Some of them attempted to unite the D&M model with an adoption model, and have used independent variables such as individual characteristics, training and user involvement. Some of the researchers, for example Alshaliby (2011) created their own model to assess HRIS success, based on the Technology Acceptance Model (TAM), user satisfaction and the DeLone and McLean IS success model (1992, 2003). Ramezan (2010) took account of certain external factors such as education, age and position to adapt the D&M model and apply it to the achievement of HRIS success. No rational analysis is given by some authors (Ramezan 2010) for their choice of theories or independent constructs for the analysis of HRIS success, even though studies can be found that quoted their successful usage of IS success theories and different independent variables. In many cases the variables were chosen personally by the researchers. The studies lack detailed explanation of the reasons behind the choice of particular variables. However, the studies seemed to miss the users' perspective in their investigations, and they did not include the human factor from the workers' and employers' perspective.

Moreover, none of these studies have considered the adoption of such systems in the Arab context or examined their adoption or success in a mandatory use environment. Also none of the studies have been conducted at public universities, which have recently also become a profitable sector of national growth and potential. The present study therefore aims to address this gap in knowledge by proposing a suitable model to evaluate the adoption, use, and success of HRIS in the mandatory context of developing countries, particularly in Saudi Arabia.

In the research mentioned above in the literature review, the author did not find any particular model designed to ascertain the efficiency and adoption of HRIS in higher education institutions – only in other organisations or structure-based companies. Consequently, the inspiration and theoretical foundation for the development of a conceptual framework model for the current study have been drawn from common models developed by previous researchers, including TAM (Davis, 1989), the diffusion

of innovation theory (DOI) (Rogers, 1995), the user satisfaction models developed by DeLone and McLean (1992, 2003), and Seddon's IS success model.

### **2.13.1 Technology Acceptance Model (TAM)**

This section discusses the TAM model, which was developed by Davis (1989). TAM was developed from the combination of the theory of reasoned action and the theory of planned behaviour to determine users' acceptance (Fishbein and Ajzen 1975). The TAM model has been used extensively to study HRIS adoption and acceptance (Suh and Han 2003, Venkatesh et al. 2003, Pikkarainen et al. 2004, Wixom and Todd 2005, Sentosa et al. 2011, Sun et al. 2013). According to the TAM model, if all things are kept equal or constant, users will adopt and use HRIS when they consider or perceive the system to be easier to use. The TAM model is used to predict user acceptance and usage behaviour; thus, users will accept and adopt an IS if they perceive that the system is easy to use and useful for day-to-day tasks. Davis (1989) originally revealed the strong link between the behavioural intention and the perceived usefulness of technology. However, there is a weak link between attitude and perceived usefulness parameters, thereby resulting in the exclusion of the attitude factor from the final TAM model. The updated version of TAM consists of two phases: a pre-implementation phase and a post-implementation phase. In both phases, according to Davis (1989), acceptance behaviour is directed by the perceived ease in terms of use and perceived usefulness; therefore, these parameters can lead to IS adoption by a particular organisation or institution. In this vein, TAM has emerged as an effective model with the ability to predict the acceptance behaviour of users based on the perceived behavioural intention and perceived usefulness.

Wixom and Todd (2005) stressed that few studies have been conducted to investigate the usefulness of TAM by involving the system and information characteristics as antecedents to the perceived usefulness and perceived behavioural intentions. Similarly, Venkatesh et al. (2003) investigated the literature on TAM by considering information and system characteristics, which might affect the core values of TAM. The TAM model was used to explore the acceptance of HRIS in the banking sector in South Korea (Suh and Han, 2002). The authors (2002) reported that the ease of use and perceived usefulness dimensions of the TAM model applied to the acceptance of technology in the banking sector of South Korea, encouraging customers to use the

system more frequently. This is supported by the study by Pikkarainen et al. (2004), who used the TAM model and reported that bank customers in Finland accepted online banking services because of the ease of use and perceived usefulness. Hari (2012) also used TAM in a study to investigate the impact of customer relationship management software on small retail businesses. These findings suggest that both dimensions – perceived ease of use and perceived usefulness – affect users’ intentions to use the system, which in turn determines the actual usage.

Davis (1989) revealed a weak relationship between attitude and the perceived usefulness, while a strong link has been found between behavioural intention and perceived usefulness. In this way, it can be argued that the TAM model has two versions: pre-implementation and post-implementation. However, in both versions of the model, both perceived ease of use and perceived usefulness form the basis of the development of acceptance behaviour among users (Davis, 1989). These conclusions influenced the development of IS models designed to measure HRIS success and effectiveness. It can be argued that TAM was the first model to steer research efforts into the domain of the formulation of IS success models. Similarly, Sentosa et al. (2011) used TAM to investigate the adoption of the Internet by small and medium entrepreneurs in Malaysia. Their study provided empirical evidence showing that two dimensions in the TAM model – perceived ease of use and perceived usefulness – influenced users’ attitudes towards system usage. These findings supported several other studies that are described above. This therefore suggests that if the development of HRIS is complex and if it is difficult to use, users will not accept or adopt it. However, when the system is easy to use, users can derive benefits from using the system and then show readiness to adopt and accept the system.

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Figure 2.1. Technology acceptance model (TAM). Source: Davis, Bagozzi and Warshaw (1989).

### *Evaluation of the TAM Model*

Even though the TAM model has been used in many contemporary research projects, it cannot be used in every case due to its numerous limitations. The biggest drawback is a surprising dearth of any practical implementation and explanation, which was pointed out by Chuttur (2009). In the publications, the TAM model is not free of criticism; for example, Bagozzi (2007) argues that TAM disregards the important social processes of implementation and developing technology which are both crucial aspects in assessing any success or achievement. Another limitation that has been described by Venkatesh and Davis (2000) is the amount and percentage of actual practice and accurate usage.

On the other hand, Adams, Nelson and Todd (1992) managed to find positive aspects of the model especially considering: 'spreadsheets, word processors, graphics, v-mail and e-mail' and established that it helped to avoid ambiguity and variety, especially with regard to the performance of users. What is more, Hubona and Cheney (1994), tried to compare two models (TAM and the Theory of Planned Behaviour [TPB]), using surveys based on assessing the levels of satisfaction of their users. They noted that the TAM is relatively easy and clear to use, thus guaranteeing technological acceptance among its users.

Problems with measurement are the most common, as it is very difficult to establish a measurement tool to investigate satisfaction, attitude and initial reaction (Agarwal and Prasad 1998). Therefore the validity and reliability of such procedures can always be questioned and cannot be in many cases be assumed to be a reliable source of data (Gefen and Straub 1997), especially with small samples on a relatively minor scale. What seems to be of the biggest disadvantage of the model is the accuracy of the self-provided report. Unfortunately if the data collected is influenced by human factors in such a way, it is incredibly difficult to be able to generalise its outcomes (Legris et al. 2003). The TAM design itself may also be questioned, as it may highlight the tendencies that the respondents may subconsciously follow (Todd and Taylor 1995, Venkatesh et al. 2003).

What has been proved above is the fact that, with regard to an investigation of HRIS, it is incredibly difficult to find and decide on the appropriate research tool, as none has ever been used before and they all lack some sort of accuracy. The other difficulty may

be the manner in which HRIS has been introduced to many institutions. The attitude towards it may vary, especially in a conservative environment where such modernisation has been externally imposed without previous notification, preparation and training (Rawstrone et al. 2000, Brown et al. 200). On the other hand it cannot be forgotten that TAM in many cases has been the most popular model in IS/IT research (e.g. Davis 1989, Yi and Hwang 2003). Nonetheless, its use may be problematic in an investigation of HRIS as it does not give users the choice and may result in unacceptable data collection (Seymour et al. 2007, Lee et al. 2008, Al-Jabri et al. 2010).

This leads to the next section, which discusses the user satisfaction model.

### **2.13.2 User Satisfaction: An Indicator of HRIS Effectiveness**

User satisfaction has been described as a very important indicator used to measure HRIS effectiveness and success in many organisations, based on the number of tasks performed with HRIS as opposed to traditional methods (Zviran and Erlich 2003). User satisfaction has been defined by several researchers in the IS literature by forging a link between the behaviour or attitude of users towards the use of an IS. For example, the definition introduced by Whitten (2004: 17) is the “extent to which users believe the information systems available to them meet their information requirements”. In the foregoing definition, the attitude perspective of an IS has been linked to the user’s satisfaction. Unlike the literature on technology acceptance, the literature on user satisfaction has given a great deal of thought and empirical support to describing the system and information characteristics as vital elements of user satisfaction (DeLone and McLean 1992). They described user satisfaction as an attitude developed by users towards an IS. Furthermore, the importance of user satisfaction in terms of measuring both upstream and downstream activities in the value chain (Figure 2.2) was realised by Doll and Torkzadeh (1991). Upstream activities are mainly described as dependent variables which cause user satisfaction; however, the downstream links refer to the behaviours influenced by satisfaction itself, where user satisfaction is counted as an independent factor (Doll and Torkzadeh, 1991).

Following a survey of the literature on user satisfaction, Sanchez and Aguayo (2007) reported that most of the literature was dedicated to measuring upstream activities, but there is a meagre amount of literature related to determining downstream values in the value chain. In a similar vein, studies to measure the performance-related behaviour

pertaining to users' satisfaction are also narrow. In the literature, studies attempting to measure user satisfaction are steered by the assumption that IS effectiveness is directly proportional to user satisfaction. However, the studies of Gatian (1994) and Melone (1990) showed that the forgoing assumption was inaccurate and does not hold any empirical value. Melone argued further that IS effectiveness depends on the organisational support structure for employees, and it may be possible to have an effective HRIS without having the element of user satisfaction. Thong and Yap (1996) reported a similar finding, which suggested that user satisfaction alone cannot be used to measure IS effectiveness, which is affected by a complex set of variables. Furthermore, in a review article published by Gatian (1994), he argued that HRIS effectiveness could not be measured by the sole consideration of users' satisfaction, which does not cover all aspects of user behaviour. The problem of linking user satisfaction with performance-related behaviour has remained a critical issue in the IS literature, as pointed out by Doll and Torkzadeh (1991). They argued that performance-related behaviour parameters might be tied to individual systems and subsequently could be considered in the specific case of an organisation, rather than being applied generally for the determination of users' satisfaction.

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Figure 2.2. User satisfaction model. Source: Al-Maskari and Sanderson (2010).

The next section explains the HRIS success models offered by DeLone and McLean (1992, 2002, 2003).

### **2.13.3 DeLone and McLean Success Model**

DeLone and McLean (1992) established one of the most extensively used models to explain IS success in different organisational set-ups. The main purpose of DeLone and McLean's (1992) model was to reduce the bulk of variables that had been developed to explain HRIS adoption and success. The existence of so many different constructs to measure the success of HRIS adoption made it difficult to compare the results of similar studies and to build a cumulative body of empirical knowledge (DeLone and McLean, 1992).

The model was developed when DeLone and McLean (1992) reviewed the IS studies of other authors from 1981 to 1987; this led to the creation of the taxonomy of an IS success model based on the review. The model suggested six interrelated variables to measure IS success: system quality, information quality, system's use, user satisfaction, organisational impact and individual impact, as shown in Figure 2.3. The six variables are not independent but rather interdependent; however, system quality and information quality jointly or independently affect user satisfaction and use. Since the development of the DeLone and McLean model (1992), several researchers have used it to investigate HRIS adoption, acceptance and success (Landrum & Prybutok, 2004, Hosnavi & Ramezan, 2010, Al-Shibly 2011).

The information quality is a construct which is applied to evaluate the output of the IS and is usually measured with the inclusion of factors such as uniqueness, usefulness, clarity, reliability, readability, relevance, accuracy, precision, entirety and report format. The system's quality is used to evaluate the overall performance of IS tools by measuring against variables such as reliability, flexibility, time taken to complete the task, response time, resourcefulness and ease of use. The "use" construct is the most widely employed in terms of measuring the success of an IS. This is measured with items such as the number of sessions taken by the user to use IS tools, number of hours per day, number of days per week, number of reports generated, charges for the use, and frequency of the time and number of functions utilised in completing a single task. This issue with measuring the "use" dimension is reported in organisations that make the use of the IS compulsory. In such situations, the system's quality and information quality become the less favourable choices.



Therefore, user satisfaction is the most important dimension of the IS success model (DeLone and McLean, 1992). User satisfaction is normally measured by considering items such as the level of satisfaction of users with the IS output by constructing a multi-item scale. Individual impact is another construct that is used to measure the impact level on the IS user and thereby leads to the measurement of IS success. Multiple items are used to measure the individual impact, such as the effectiveness of decisions, time consumed to make decisions, information recall, learning, test scores and efficiency in the accomplishment of tasks. The organisational impact measures the overall impact of IS use on the performance of an organisation, and it considers different items to measure the impact, such as innovation, revenues generated, profits, inventories, staff and quality of the tasks being accomplished.

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Figure 2.3. DeLone and McLean's 1992 Success Model

The DeLone and McLean (1992) IS success model has been widely used, either as originally devised, or modified to provide valuable contributions to the literature on HRIS success. According to Shannon and Weaver (1949), information output, or the message in a communication, can be measured on technical, semantic and effectiveness levels. System quality is measured at a technical level, while information quality is measured at a semantic level, and use, user satisfaction, individual impact and organisational impact are measured at the effectiveness level. Shannon and Weaver (1949) further explained that information output should be accurate and efficient, as successfully transmitting the intended meaning is necessary. Based on Shannon and

Weaver's (1949) studies, DeLone and McLean (1992) concluded that information flows through a series of states from its production through its use or consumption to its influence on individual and/or organisational performance. They developed the six constructs of the HRIS success model out of Shannon and Weaver's (1949) three constructs. These constructs match Shannon and Weaver's (1949) three-construct model containing system quality at the technical level, information quality at the semantic level, and use, user satisfaction, individual impact and organisational impact at the effectiveness level. Rai, Lang and Welker (2002) used the DeLone and McLean (1992) model to examine successful IS adoption in an organisation. Their findings confirm support for DeLone and McLean's (1992) argument that HRIS success models should be carefully specified in a given context to explain the success of adoption.

Shin (2003) used DeLone and McLean (1992) to determine the effectiveness of HRIS success in terms of system quality, information quality and service quality on user satisfaction in a data warehouse. They used survey questionnaires and interviews to solicit information from respondents and confirmed that the DeLone and McLean (1992) model is able to explain the effectiveness of HRIS success. Thatcher and Oliver (2001) investigated the impact of technology investments on performance in organisations, using product quality, production efficiency and firm productivity. Thatcher and Oliver's (2001) findings are inclusive and explain whether IS investment improves performance. Since its inception, DeLone and McLean's success model (1992) has received criticism from many researchers, such as Pitt et al. (1995) and Seddon (1997). Pitt et al. (1995) suggested that the model should incorporate service quality. This is because service quality is a construct that is able to explain IS success. Seddon (1997) proposed that system use should be removed from the model because system use does not explain IS success, but rather it explains behaviour; hence, it is more appropriate to include system use in a process model than in a causal model. Other authors have supported these suggestions, including Kettinger and Lee (1994) and Wilkin and Hewitt (1999). They agreed that service quality should be incorporated into the model to explain IS success. Moreover, other researchers have modified DeLone and McLean's (1992) success model and used it to investigate the success of knowledge management (Wu and Wang, 2006). Livari (1987) modified the model and used it to test IS success and found that perceived system quality and perceived information quality are significant predictors of user satisfaction, but not system use. The model

received constructive criticism from Seddon (1997), who modified DeLone and McLean's model by providing interpretations to each construct and some additional constructs, such as the measurement of HRIS adoption use for society, organisations and individuals.

#### **2.13.4 Seddon's Model for the Measurement of IS Use and Success**

Seddon raised objections about DeLone and McLean's IS success model by positing that it incorporates many meanings and contexts for the dimensions being used, and often leads to non-specificity and confusion by combining a causal model and a process model within a single model. For example, he referred to different interpretations of the "use" construct: use can be regarded as an event affecting the organisation and individual impacts; "use" can be taken as source of benefits; and "use" can be a dependent variable in the variance model. Against this backdrop, Seddon proposed an IS success model in which he tried to alleviate the ambiguities found in the DeLone and McLean model (Figure 2.4).

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Figure 2.4. IS Success Model Presented by Seddon (1997)

Seddon provided interpretations and a definition for the constructs used in his IS success model; however, these appendages cannot be found in DeLone and McLean's model. Seddon elaborates on various constructs in his model in this way: information quality is linked with accuracy, relevance and timeliness; system quality is related to reliability, maintenance of codes and programs, user interface, users' ease of use and the level of bugs in the system; the construct – perceived usefulness – deals with the perception of system usability to increase the performance of tasks; user satisfaction evaluates the outcome of the system's use in a subjective manner; and the HRIS adoptions section of the model measures the IS HRIS adoptions to individuals, organisations and society (Seddon, 1997).

#### **2.13.5 Updated DeLone and McLean IS Success Model**

Based on the criticisms and recommendations of other IS researchers, DeLone and McLean (2003) modified their 1992 model and constructed a new model that incorporated service quality as one of the constructs to explain IS success. They proposed that information quality, system quality and service quality affect system use and user satisfaction (Figure 2.5). Another update introduced into the new model is HRIS adoptions, which replaces individual and organisational impact (Figure 2.5). This is because the IS influences both individuals and organisations and thus affects societies, work groups and organisations (Seddon et al. 1999). Researchers that have used the DeLone and McLean (2003) model to explain information success include Landrum and Prybutok (2004), and Almutairi and Subramanian (2005). Landrum and Prybutok (2004) tested DeLone and McLean's (2003) success model by collecting 385 responses from two U.S. Engineer Army Corps cases of successful use of libraries. They found that system quality, information quality and service quality have a significant effect on user satisfaction and usefulness. In another study, Almutairi and Subramanian (2005) used the DeLone and McLean (2003) success model to investigate private sector organisations in Kuwait. They found that information and system quality impact user satisfaction significantly and that system use has a significant impact on individuals. This therefore suggested that DeLone and McLean (2003) responded to the criticism and recommendations made by other researchers, and produced a more robust model.

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#### Figure 2.5. Updated DeLone and McLean (2003) Information Success Model

What must not be forgotten is the fact that none of these models have ever been actually tested in the context of developing countries like Saudi Arabia (Imran et al. 2005), which due to their traditions, history and culture are exceptional and even more interesting to have an insight into. The cultural differences can therefore make it impossible to follow western models of assessment in a country that in its essence is so different. A different approach is thus needed in order to fulfil the background and citizenship requirements. What may be of a great significance to the final outcomes is the nature of HRIS implementations. It seems vital to take into consideration whether the nature of these changes are voluntary or compulsory. Finally, there has been no research into HRIS adoption at public universities using the D&M model as a framework. Considering all the above factors, this study is going to base empirical research on the D&M model as the basis of its conceptual model.

The reasons for regarding the D&M model as the most likely to be successful in this research is that it seems to provide the widest and the most elaborative information evaluation presented in the literature related to this work (Myers et al. 1997, Heo and

Han 2002, Halawi et al. 2007). Previous scholars who tried to deal with the IS phenomenon used it with positive opinions and relatively reliable data collection. The framework presented and used in this model has a strong tradition and was an inspiration for research conducted under many circumstances in a variety of cultural circles of different countries, including countries from MENA such as Kuwait, Taiwan and Iran (Alshaliby 2010). Therefore, it may even come as a greater surprise to learn that such a model has never been described, presented and used in the KSA. This is another valuable argument for the fact that there is a great need to test its validity in that country (Petter and McLean 2009).

Even though the nature of this thesis and the research is different from other IS-based research investigated from the literature above, it can be assumed that the D&M updated IS success model should be successfully implemented in this study on the successful adoption of HRIS among universities in the KSA. However, the model is not free from limitations, as can be seen from the updated version. The D&M updated model was established and created based on critical review and meta-analysis and was not tested empirically in a variety of contexts among different cultures with the inclusion of dimensions that present social pressure (Seddon 1994).

#### **2.14 A Proposed Conceptual Framework to Examine HRIS Adoption and Use in Public Universities in Saudi Arabia**

As a result of the literature review concerning the conceptual models it has therefore been decided that in order to gather comprehensive and reliable data, more than one conceptual model must be taken into consideration. It has been decided that the updated D&M IS success model (2003) could be a reliable research tool.

Additionally, it has been noted that such a conceptual model may supply the study with the biggest number of crucial components in order to assess to what extent the adoption and use of HRIS in KSA universities have been successful or not. These multi-dimensional relationships will embrace interconnected elements such as information quality, system quality, service quality, system use, user satisfaction and HRIS adoption.

In general, the overall evaluation can be sub-divided into three categories: information that is stores, supplies and provides, the system as a set of connections, network within one needs to operate and the service with such software and distribution provides and

serves within institutions. However what is assumed to be of the highest importance, especially focusing on the cultural peculiarity of the KSA, is user satisfaction. The country has a stereotypical image of being in opposition to quick modernisation and development, too often associated with the culturally totally different western world, and this therefore makes it an interesting location for the study.

The success of any HRIS adoption and use depends strongly upon the perceived use, usefulness, system quality, information quality, service quality, user satisfaction, and attitudes of individuals. Reviewing the literature on HRIS has revealed the following gaps in the research:

1. There is no specific model developed by other HR researchers to measure the success of HRIS. However, some well-documented, extensively researched and well-cited models have been designed to measure the success of IS within organisations, such as TAM, the user satisfaction model, the Seddon model and the Donald and Maclean model. In addition, these IS models have been modified and used to investigate the different aspects of HRIS within organisations (Al-Shibly 2014, Urbach, Smolnik and Riempp 2010). Consequently, the current study has modified the Donald and McLean model to fit it into the framework of the current research. This will measure the developed IS, which have been employed by various researchers to measure the impact of HRIS use on the HR practices of HR Departments in public universities of Saudi Arabia.
2. There are many studies on the impact of HRIS on organisations; however, no study has looked at HRIS adoption and use in Saudi Arabian higher education.
3. Reviewing the literature on HRIS/IS adoption and success models, it was observed that there is no model that has incorporated subject norm to explain HRIS adoption and success in organisations.
4. In the first phase of this study related to the qualitative data analysis discussed in Chapter 4 (section 4.1.8), it was noted that the dimension of “subjective norm” is an important one that needs to be considered in the second phase based on the first phase findings. This dimension has been used in different contexts such as in Internet banking and e-commerce. For example, Al-Somali, Gholami and Clegg (2009) looked at the acceptance of online banking in Saudi Arabia. Also, Eid (2011) addressed the determinants of e-commerce customer

satisfaction, trust and loyalty in Saudi Arabia. However, no previous study has used this dimension in the measurement of HRIS; therefore, this study will use this dimension. There are many reasons for using the subjective norm dimension for the current study: (1) the Saudi Arabian context is mainly driven by culture and traditions, as noted in the first phase; (2) the internal environment in public universities is not supportive in terms of encouraging the employees to use HRIS in their daily work; (3) organisations are subsequently inclined to employ traditional methods; and (4) this dimension needs to be considered in organisations with dominant cultural elements and with deferent contexts, according to the last paper published by Petter et al. (2013).

5. During the literature review, it was observed that earlier empirical studies on HRIS have predominantly used the DeLone and McLean (1992, 2003) success model wholly or in a slightly modified form. However, there is no comprehensive study that has examined the relationship between subjective norm, system quality, information quality, service quality, user satisfaction and system use, and their combined effect on organisational impact. This study aims to build a conceptual framework to analyse the level of HRIS adoption and use in Saudi Arabian public universities. Therefore, the researcher has developed the conceptual framework by introducing alterations to DeLone and McLean's model to make it appropriate for measuring HRIS adoption and use in Saudi Arabian public universities (Figure 2.6). This model is designed to measure the various dimensions such as system quality, information quality and service quality and their impact on system use and user satisfaction, and the overall benefit of HRIS adoption.



## **2.15 Relationships and Hypotheses Development**

The relationships between various dimensions in the proposed conceptual framework are analysed based on the foregoing studies on IS success model building approaches.

### **2.15.1 System Quality**

System quality represents the quality of the information system processing itself, which includes software and data components, and it is a measure of the extent to which the system is technically sound. Seddon (1997) notes that system quality is concerned with whether there are bugs in the system, the consistency of the user interface, ease of use, and quality of documentation. System quality is measured by attributes such as ease of use, functionality, reliability, data quality, flexibility, and integration (DeLone and McLean 2003). What can be understood from these brief definitions of the quality of the system is that it demands constant evaluation in order to ensure proper functionality and user satisfaction. The information system, as with any other system, also needs to be constantly evaluated, as high quality is a desirable characteristic of any information system (Urbach et al. 2011).

In order to maintain high standards in any IS operation, regular updates and checks of software and data storage must be carried out. The technical side of the IS is the component which can never be neglected, as in many ways its effectiveness depends on the software cohesion and collaboration. As many studies have proved, the

maintenance of systems' quality can be reflected in positive users' attitude and great satisfaction.

Many studies have found that system quality has a positive and strong correlation with user satisfaction at the individual level (Iivari, 2005). Petter and McLean (2008), in their investigation analysing nine different studies, also confirmed in a reliable way that systems' quality had a great impact on users' satisfaction.

It seems to be an undeniable truth that the quality is highly important for any work carried out within the system, as it has a strong influence on the satisfaction level of its users (Fitzgerald and Russo 2005, Caldeira and Ward 2002). Even though some studies did not seem to agree with that on a greater scale (Floropoulos et al. 2010), findings in the majority of analyses showed that quality was significant in measuring successfulness of the adoption of HRIS (Ramezan 2010, Alshaliby 2011, Bal et al. 2012).

Since the development of the IS success model by DeLone and McLean (1992), the system quality construct has been used by other researchers to explain the success of HRIS adoption and use. System quality is the degree to which HRIS is easy to use in accomplishing tasks (Schaupp, Fan and Belanger 2006). Thus, it considers HRIS functionality, usability and performance characteristics (McKinney, Kanghyun and Zahedi 2002). Authors who have used system quality to measure HRIS success are Swanson (1974), Hamilton and Chervany (1981), Rai, Lang and Welker (2002), Gable, Sedera and Chan (2003), Shin (2003), Sabherwal, Jeyaraj and Chowa (2006), and Urbach, Smolnik and Riempp (2010). Swanson (1974), Davarpanah and Mohamed (2013), Al-Khowaiter (2013) used diverse system quality instruments, such as the reliability of computers, speed of response of online activities and ease of use to measure the appreciation of IS applications in an organisation.

Meanwhile, Hamilton and Chervany (1981) suggested the use of data accuracy, turnaround time, and speed of response, reliability, flexibility of the system and ease of use to measure system quality. Rai, Lang and Welker (2002) used two instruments (user friendliness and ease of use) to measure system quality in their study. Shin (2003) used system quality in a data warehouse study to measure ease of use, ability to locate data, access authorisation and data quality. Wixom and Todd (2005) defined system quality

in terms of reliability, flexibility, integration, accessibility and timeliness in their combined model of user satisfaction and technology acceptance. Sabherwal, Jeyaraj and Chowa (2006) explained system quality as the quality of HRIS as a system that is easy to use, reliable and responsive to time.

Gable, Sedera and Chan (2003) used the system quality construct to measure the success of an enterprise IS in an organisation. In a related study, Sedera and Gable (2004) used nine validated instruments to measure system quality for enterprise system success. The nine instruments included ease of learning, system features, ease of use, user requirements, system accuracy, flexibility, sophistication, integration and customisation. This leads to the development of the following hypotheses:

*H<sub>1</sub>: System quality will positively affect the use of HRIS.*

*H<sub>2</sub>: System quality will positively affect user satisfaction with HRIS.*

The items used in this research to measure perceived HRIS system quality are listed below in Table 2.4.

**Table 2.3. Measurement Items Designed for Perceived HRIS system quality**

Construct	Items	NO	References
System quality	<p>1 HRIS is easy to navigate.</p> <p>2 HRIS allows me to easily find the information I am looking for.</p> <p>3 HRIS is easy to use.</p> <p>4 HRIS is well-structured.</p> <p>5 HRIS offers comfortable access to all the business applications I need.</p>	5	<p>D&amp;M (1992/2003)</p> <p>Almutairi and Subramanian (2005)</p> <p>Ahn et al. (2004)</p> <p>McKinney et al. (2002)</p> <p>Nils Urbach *, Stefan Smolnik, Gerold Riempp (2010)</p>

### ***2.15.2 Perceived HRIS Information Quality***

In the very narrowed down context of information systems, in any system used to manage human resources, the quality of the information is very important. In general, its simplest definition is ‘the quality of the information that the human resource information system produces and delivers’ (DeLone and McLean 1992 p.13). The conclusion can be drawn that the delivery of relevant and up-to-date information that is easily understood can definitely have an impact on the level of user satisfaction (Wixom and Todd 2005).

Some authors went even further (Petter, 2008) and assumed that the quality of such information is the major component influencing user satisfaction, along with user-friendly equipment (e.g Rai 2002, Urbach, 2011, Halawai 2007). Hussain et al (2007) reported that use of HRIS is enhanced through increasing the information quality in both medium and large sized organizations. In addition, connecting quality with the D&M model analysed earlier in the study, Petter and McLean (2009) stated that after closer insight into five different studies, they had found a strong relationship between information quality and being satisfied with IS, especially in HRM usage.

Information quality is another instrument used to measure HRIS success. It measures the quality outputs of an IS and their usefulness to the user (McKinney, Kanghyun and Zahedi 2002). Information quality has previously been used by many researchers to measure the success of HRIS (McKinney, Kanghyun and Zahedi 2002, Rai, Lang and Welker 2002, Gable, Sedera and Chan 2003, Shin 2003, Wixom and Todd 2005, Urbach, Smolnik and Riempp 2010, Wang and Liao 2006, Petter et al 2009, Hosnavi and Ramezan 2010). The literature on HRIS success suggests that the quality of output produced by any HRIS or IS should be in the form of reports. On the other hand, some authors have not considered information quality as a construct for measuring information success; it is rather used for measuring user satisfaction (Baroudi & Orlikowski 1988). Baroudi and Orlikowski (1988) used a multi-dimensional instrument to measure HRIS user satisfaction and suggested that relevance, reliability, precision, completeness and accuracy are the main dimensions for measuring information quality.

Wixom and Todd (2005) used user satisfaction and TAM to develop an integrated model to measure information quality in terms of completeness, accuracy, format and currency of information. Al-khowaiter et al (2013) and Alshibli (2014), and Davarpanah and Mohamed (2007) determined the association between the information

quality and HRIS using M&D models. Rai, Lang and Welker (2002) developed seven instruments to measure information quality; this instrument consists of attributes of information, content of information, accuracy and the information format required by the users. In another study, Shin (2003) determined information quality items by measuring the usefulness of HRIS in an organisation by using data acquired from a data warehouse. An earlier study by Ahituv (1980) developed five information quality instruments in terms of accuracy, timeliness, relevance, aggregation and formatting of information, and these were used to measure information quality in organisations.

DeLone and McLean (1992) reported that information quality and system quality, individually and jointly, affect user satisfaction and use. Petter et al (2009), and Alshibly (2014) validated and implemented the DeLone and McLean model and revealed that strong association between the information quality and the users satisfaction. Unlike other HRIS applications, such as operating systems that do not have outputs to users, HRIS produces output, such as reports and documents. Therefore, system quality and information quality have significant effects on system use in DeLone and McLean's model (1992, 2003). Therefore, the following hypotheses are developed to test the impact of information quality on user satisfaction:

*H<sub>3</sub>: Information quality will positively affect the use of HRIS.*

*H<sub>4</sub>: Information quality will positively affect the user satisfaction of HRIS.*

The items used in this research to measure perceived HRIS information quality are listed below in Table 2.5.

**Table 2.4. Measurement Items Designed for Perceived HRIS Information quality**

Construct	Items	NO	References
Information quality	1 The information provided by our HRIS is useful.  2 The information provided by our HRIS is understandable.  3 The information provided by our HRIS is interesting.  4 The information provided by our HRIS is reliable.  5 The information provided by our HRIS is complete.  6 The information provided by our HRIS is up-to-date.	6	D&M (1992/2003)  Almutairi and Subramanian (2005)  Lin and Lee (2006), McKinney et al. (2002), and Yang et al. (2005)  Nils Urbach*, Stefan Smolnik, Gerold Riempp (2010)

### **2.15.3 Perceived HRIS Service Quality**

This section discusses service quality as one of the constructs for measuring the success of IS adoption. As competition increases in the IT sector, this demands that IT specialists not only be creative in developing hardware and software, but that they also provide the highest quality of service to customers. This therefore suggests that the provision of high service quality can result in high customer retention, customer satisfaction and high profits (Jiang et al. 2003). Service quality is a construct that is used to measure the overall service that HRIS users experience from using a system to perform HR functions (Urbach 2010). Any information system embraces many additional components, one of which is the service supplier. The supplier has a great impact on the easiness of operating the system, with no differentiation between a separate organisation or institutional department (DeLone and McLean 2003). Due to the consistent growth of IS influence in any HR Department, one of the priorities is to

maintain and supply the high quality of service to its users, also for the sake of the human workforce within the institution in which it is implemented (Chiu, Chiu and Chang 2007). However, some studies showed that there is no significant relationship between the service quality and the use (Petter et al., 2009; Fitzgerald and Russo, 2005; Halawi et al., 2007; Kositanurit et al., 2006).

What should be understood is the fact that both users and recipients of the service must be equally satisfied and neither one should be in a superior position over the other. Only the fulfilment of the expectations of both can guarantee satisfaction with the IS and help to build a positive rapport between HRM and the human workforce of any organisation. There have been many studies that seem to confirm this assumption and therefore it can be regarded as valid in theory and in practical application (Petter 2008 and 2009; Alkhawaiter et al., 2013; Alshibli, 2014; Devarpanah and Muhamaed, 2013). In the context of HRIS in particular, this has been found to be significant. There is the assumption that service quality and user satisfaction are not integrally related and therefore it is not going to be a subject of further discussion (Haines et al. 1997).

The success items may include responsiveness, reliability, competence and empathy (Cha-Jan Chang and King 2005). Authors who have used service quality as a measure of HRIS success include Landrum and Prybutok (2004), Gorla, Somers and Wong (2010), Urbach, Smolnik and Riempp (2010), Udo, Bagchi and Kirs (2010), and Miller, Hardgrave and Jones (2013). Landrum and Prybutok (2004) investigated the success of a library operation by using a modified version of the DeLone and McLean (1992) model. They proposed that service quality relates to other variables, such as system quality and information quality. Davarpanah and Mohamed (2007) determined the association between the information quality and HRIS using M&D models.

The instruments that Landrum and Prybutok (2004) used to measure service quality included keeping users informed, having a prompt service to users, being willing to help users and performing the service correctly the first time. The purpose of Urbach, Smolnik and Riempp's (2010) investigation was to gain a better understanding of employee portal success. Their theoretical model was also based on the information success model of DeLone and McLean (1992). They tested their hypotheses through 10,000 employees from 22 companies. The results of their study indicate that besides the factors contributing to IS success in general, other success dimensions, such as the

quality of collaboration and process support, need to be considered when aiming for a successful employee portal. This therefore suggests that service quality, which is the measure of the extent of service that HRIS users experience, needs to be experienced firsthand and should also be tangible and responsive. From the literature, it is clear that there have been no studies on measuring HRIS service quality in educational institutions; this gap has been identified and will be investigated by testing the following hypotheses:

*H<sub>5</sub>: Service quality will positively affect the use of HRIS.*

*H<sub>6</sub>: Service quality will positively affect user satisfaction of HRIS.*

The items used in this research to measure perceived HRIS service quality are listed below in Table 2.6.

**Table 2.5. Measurement Items Designed for Perceived HRIS Service Quality**

Construct	Items	NO	References
Service quality	1 The responsible service personnel are always highly willing to help whenever I need support with the HRIS.		D&M (1992/2003)
	2 The responsible service personnel provide personal attention when I experience problems with the HRIS.		Almutairi and Subramanian (2005)
	3 The responsible service personnel provide services related to the HRIS at the promised time.		Chang and King (2005) and Pitt et al. (1995)
	4 The responsible service personnel have sufficient knowledge to answer my questions in respect of the HRIS		Nils Urbach*, Stefan Smolnik, Gerold Riempp (2010)



#### **2.15.4 Perceived HRIS Subjective Norm**

Subjective norms and attitudes have been used by many people to predict the behaviour of individuals. Subjective norm is the opinion an individual has formed about what others believe and how they want an individual to behave or act (Ajzen and Fishbein 1980, Trafimow 1994). Trafimow (1994) and Kraus (1995) have reported that subjective norm and attitudes are reliable predictors of behaviours and intentions to behave in a certain way. Researchers that have investigated subjective norm, attitudes and perceived behavioural control include Ajzen (1991); Taylor and Todd (1995); Venkatesh and Davis (2000); Yuen and Ma (2001); George (2004); and Wong et al. (2005).

George (2004) used the theory of planned behaviour (TPB) to investigate the relationships between beliefs, Internet privacy and trustworthiness. George's (2004) findings suggest that individuals' beliefs about trustworthiness have a positive effect on attitudes towards buying online, which in turn confidently influence purchasing behaviour. A belief about self-efficacy with regard to purchasing has a positive effect on perceived behavioural control, which in turn influences online purchasing behaviour. Wong et al. (2005) investigated the use of the Internet by pre-service teachers, using survey questionnaires for 310 respondents. They found that pre-service teachers' use of the Internet was influenced by support from friends, confidence level and perceived attitude towards Internet use. This therefore suggests that individuals perceive that the use of IT can be influenced by what they feel others expect of them. This therefore leads to the following hypotheses:

*H<sub>7</sub>: Subjective norm will positively affect the use of HRIS.*

*H<sub>8</sub>: Subjective norm will positively affect the user satisfaction of HRIS.*

The items used in this research to measure perceived HRIS subjective norm are listed below in Table 2.7.

**Table 2.6. Measurement Items Designed for Perceived HRIS Subjective Norm**

Construct	Items	NO	References
Subjective norm	<p>1 People whose opinions I value would approve of my using HRIS in my daily work routine</p> <p>2 People who are important to me would approve if I used HRIS in my daily work routine.</p> <p>3 People who influence my behaviour would think that I should use HRIS to finish my daily work tasks.</p> <p>4 It is expected of me to use HRIS in my daily work routine.</p>	4	Adopted and modified from Ajazen (1991 ) and Venkatesh & Davis (2000)

### 2.15.5 Perceived HRIS System Use

HRIS would be of only minor importance if it was not used in practice by people in HR. HRIS system use can be defined simply as the extent to which staff make use of the capabilities provided by the information system (DeLone & McLean, 2003).

This section presents system use as one of the constructs for measuring IS success. System use measures the perceived actual use of HRIS by the staff of an organisation (Urbach, Smolnik & Riempp 2010). Other researchers have criticised system use as a measure to determine IS success. Zviran and Erlich (2003) argued that system use is not a strong construct to measure system success in a situation where system usage is mandatory, for example, when an IS is required in a big hospital to provide accurate records of patients. However, if system use is used to measure system success by

voluntary users, as opposed to captive users, then system use is appropriate (Lucas 1978, Welke & Konseynski 1980).

The variety of investigations and research taking the practical approach, such as Chiu (2007) or Halawi et al (2007), defined integral correspondence between both the ease of use and the satisfaction that users may gain. The gap in the research may, however, be found in the specific context of HRIS as a unique sector where ISs have recently been adopted. What is more, Petter (2008) also claimed that it would be of great interest to incorporate HRM as a research background in order to assess the successfulness of the mutual connection between use and user satisfaction.

Other authors who have used system use to measure user satisfaction and effectiveness are DeLone and McLean (1992); Rai, Lang and Welker (2002); Al-khuwaiter et al (2013); Al-Shibli (2014), Davarpanah and Mohamed (2013), and Urbach, Smolnik and Riempp (2010). Sabherwal, Jeyaraj and Chowa (2006) utilised system use as a construct to measure an individual's behaviour or the effort put into using HRIS, while Urbach, Smolnik and Riempp (2010) measured the success of an employee portal by employing system use to measure the perceived length of time that different functionalities were used to retrieve and publish information, and collaborate, communicate and execute work processes in 22 companies. They found that system use has an impact on individual user satisfaction.

*H<sub>9</sub>: The use of HRIS will positively affect the organisational benefit.*

The items used in this research to measure perceived HRIS system use are listed below in Table 2.8.

**Table 2.7. Measurement Items Designed for Perceived System Use**

Construct	Items	NO	References
System use	1 I use HRIS to retrieve information. 2 I use HRIS to publish information. 3 I use HRIS to communicate with colleagues. 4 I use HRIS to store and share documents. 5 I use HRIS to retrieve colleagues' contact information. 6 I use HRIS to retrieve competence profiles. 7 I use HRIS to network with colleagues. 8 I use HRIS to execute work processes.	8	D&M (1992/2003)  Almutairi and Subramanian (2005)  Nils Urbach *, Stefan Smolnik, Gerold Riempp (2010)

### 2.15.6 Perceived HRIS User Satisfaction

User satisfaction has already been mentioned in connection with quality of various factors such as service, use, or the quality of systems in general. However, it has never been fully explained before. It can also be predicted that the factor is very difficult to measure as it is based on the human assessment of each individual, and subjective factors can in many cases influence the outcome.

User satisfaction is a personal evaluation of a satisfied-unsatisfied scale of various aspects of an IS (Seddon 1997). DeLone and McLean, (1992), Klenke (1992) and Melone (1990) contributed enormously to the subject matter of establishing successfulness from the users' perspective of the implementation of IS. They also gave user satisfaction a status of a determiner of the success of an information system. It is a truth universally acknowledged that in a mandatory environment, satisfaction is more applicable to measuring a system's success than intention to use (Teo 2008, Lee & Park 2008, Rawstorne 1998).

What should not raise any surprise is the fact that Petter and McLean (2008) in their meta-analysis of 31 studies discovered a significant interconnection between user satisfaction, network profit and benefit. Similar findings reported by some other studies such as Al-khuwaiter et al (2013); Al-Shibli (2014), and Davarpanah and Mohamed (2013)

There have been studies that tried to measure the intention to use, however that is not going to be a relevant part of this thesis (DeLone and McLean 1992, Seddon 1999, Rai, Lang, and Welker 2002). What can be briefly mentioned is that the intention may positively influence satisfaction, with the right intention increasing satisfaction and the opposite being true. The lack of right intention increases dissatisfaction and decreases satisfaction. In the specific context of HRIS, all the studies have found a positive relationship between user satisfaction and HRIS success and use.

User satisfaction is another construct used extensively to measure the success of an IS. User satisfaction is the affective response expressed by users when they are happy after using the IS; in other words, it is a construct that measures users' feelings, understanding and participation in the use of an IS (Raymond 1985, Urbach, Smolnik and Riempp 2010). The measurement of how an individual is satisfied with IS usage has become one of the main constructs for determining the success or effectiveness of an IS (Davis and Olson 1984, Raymond 1985, Urbach, Smolnik and Riempp 2010). Many researchers have applied user satisfaction to measure HRIS success (Bailey and Pearson 1983, Davis and Olson 1984, Raymond 1985, Doll and Torkzadeh 1994, Urbach, Smolnik and Riempp 2010).

Bailey and Pearson (1983) defined user satisfaction as the positive and negative reactions of an individual to factors that affect the success of an IS. They used a construct consisting of 39 items to measure user satisfaction in organisations. Urbach, Smolnik and Riempp 2010) employed user satisfaction as a construct to measure employee portal success in 22 organisations. They used the DeLone and McLean (2003) success model and concluded that besides factors such as user satisfaction, there are other factors that contribute to the success of employee portal adoption and use, and they are system quality and process support. The next section discusses the impact on the individual from HRIS or IS adoption.

*H<sub>10</sub>: User satisfaction with an HRIS will positively affect organisation benefits.*

The items used in this research to measure perceived HRIS user satisfaction are listed below in Table 2.9.

**Table 2.8. Measurement Items Designed for Perceived HRIS User Satisfaction**

Construct	Items	NO	References
<b>User Satisfaction</b>	1 HRIS has met our expectations.	4	D&M (1992/2003)
	2 The employees of the HR Department appear to be satisfied with our HRIS.		Seddon and Kiew (1994)
	3 HRIS could be better utilised.		Nils Urbach Stefan Smolnik, Gerold Riempp (2010)
	4 Overall I am satisfied with our HRIS.		

### **2.15.7 Individual Impact**

Individual impact is one of the constructs that have been used to measure the success of an IS. Individual impact measures the benefits that individuals gain through the use of an IS. It is an indication that an IS gives the user a better understanding of the decision-making context and improves an individual's decision-making process, thus leading to change in the user's activity (DeLone and McLean 1992, Urbach, Smolnik and Riempp 2010). On the other hand, Seddon (1997) defined individual impact as the benefits individuals gain from HRIS use. Many authors have suggested that IS adoption influences the nature of work in an organisation, improves job satisfaction and the quality of the social and work life of individual workers. Kaye and Sutton (1985) and DeLone and McLean (1992) found that the computerisation of an organisation influences office work productivity and the quality of work life balance.

### **2.15.8 Organisational Impact**

Organisational impact is one of the dependent variables that have been used to determine the success of organisations by many authors (Cerullo 1980, Senn and Gibson 1981, Rivard and Huff 1984, Urbach, Smolnik and Riempp 2010). Organisational impact includes measures such as cost reduction, competitive advantage

and quality improvement (Urbach, Smolnik and Riempp 2010). Sedra et al. (2004) used a multi-dimensional instrument to measure information success; this included organisational impact in terms of staff reduction, cost reduction, overall productivity, improved output, increased capacity, e-government and business process change. Gupta et al. (2006), in their study of governmental organisations, identified several measures of IT effectiveness, including communication, decision making, effectiveness and organisational responsiveness.

#### **2.15.9 Perceived HRIS Adoption Usage**

The adoption dimension is regarded as an important indicator of the success of IS usage by organisations, as it measures the positive or negative impact on the profitability of the IS for the users within the organisation (Ishman, 1998). With the increasing continuum of IS activities, various researchers have suggested the importance of determining the IS impact on consumers, investors, society, industry and so on. Some researchers have suggested that placing all these impacts within a single model would lead to complexities arising from the interrelations of so many dimensions (Petter et al., 2009; Al-shibli, 2014; Al-khowaiter, 2013; Halawi et al., 2007). Therefore, Seddon (1997) and DeLone and McLean (2003) grouped all these impacts into a single category called “HRIS adoptions” (HRIS adoption usage). DeLone and McLean stated in their previous model that the HRIS adoptions (HRIS adoption usage) dimension was avoided for the sake of economy, though they knew the importance and significance of this dimension in measuring the overall IS success in terms of use and adoption. They further stated that without having deep insight into the information quality and system quality dimensions, the HRIS adoptions (HRIS adoption usage) dimension could not be measured and analysed (DeLone & McLean, 2003). The HRIS adoptions (HRIS adoption usage) measure can be determined by involving various factors, such as the profitability of the IS, the objectives and contexts of the investment, and perceived usefulness. Taking multiple measures at various levels for measurement of HRIS adoptions (HRIS adoption usage) is likely to complicate the data analysis and interpretation. To measure various aspects of the impacts, such as innovation, consumer satisfaction, management control and task productivity, Torkzadeh and Doll (1999) and Rai et al (2007) created a comprehensive instrument that has a strong fit with the HRIS adoptions (HRIS adoption usage) construct in the DeLone and McLean model.

The successful measurement of organisational HRIS adoption usage must involve those people who are authorised to answer questions pertaining to organisational managers. For example, an approach that involves asking IS users questions is a poor one in terms of evaluating the profitability due to an IS. Interviewing senior managers and consulting the annual reports of an organisation are more appropriate approaches when seeking to measure the HRIS adoptions of an IS (Petter et al. 2008). This study will therefore test a new integrated and modified model, shown in Figure 2.6.

The items used in this research to measure perceived HRIS HRIS adoption are listed below in Table 2.10.

**Table 2.9. Measurement Items Designed for Perceived HRIS Adoption Usage**

Construct	Items	NO	References
Organisation HRIS adoption usage	<p>1 HRIS has helped my university to improve the efficiency of internal operations.</p> <p>2 HRIS has helped my university to improve the quality of working results.</p> <p>3 HRIS has helped my university to enhance and improve coordination within the university.</p> <p>4 HRIS has helped my university to enhance and improve collaboration within the university.</p> <p>5 HRIS has helped to distinguish my university from similar universities.</p> <p>6 HRIS has helped my university to make itself an overall success.</p>	6	<p>D&amp;M (2003)</p> <p>Davis (1989)</p> <p>Nils Urbach *, Stefan Smolnik, Gerold Riempp (2010)</p> <p>Sabherwal (1991)</p>

## 2.16 Summary

This chapter focused on three main components essential to understanding HR and HRIS, in order to conduct empirical research and present its outcomes in further sections of this thesis. This chapter has tried to explain the importance of the HR Department (Gable et al. 2008) in each organisation and especially the aspect of its management, which has significant impact on the satisfaction and efficiency of the



working force (Khan, Khan and Mahmood 2012). The adoption, use and success of IS in an HR environment, and the gaps in the literature, were identified for future study. The review revealed that there are many reasons why attention should be given to the development of human resources, in order to continue positive innovation in developing countries such as Saudi Arabia (Fadhel 2007). That section was immediately followed by the indication of the role of IS and IT, which are the main factors in the successful adoption and execution of HRIS. As was pointed out, there is no agreement and consistency in measurement tools and therefore different units of measurements and methodologies have been used to study IS success. In addition, many studies have used constructs such as system quality, information quality system use and user satisfaction to explain HRIS adoption and success within organisational settings. The insights from the theories and models analysed by other researchers, as presented in this chapter, allowed the researcher to develop a HRIS success model for HR Departments at public universities in Saudi Arabia. The constructs of this model were derived from the original models presented by Delone and MacLean (1992, 2003). The important hypotheses were developed and were measured in the quantitative phase, as discussed in detail in Chapter 5. However, before the detailed analysis of the findings, the very next chapter discusses the methodology used for the purposes of this study.

## **CHAPTER 3: METHODOLOGY**

### **3.1. Introduction**

The research methodology, according to Salkind (2010), is a systematic approach involving the specific guidelines and tools referred to as research framework. It consists of a research strategy, research design, and the chosen method of data collection and analysis, in order to find the solutions to the research problems. Consequently, this chapter introduces the tools and guidelines followed to carry out the current study, which includes the choice of research philosophy, the research methods, and data analysis.

Johnson et al. (2007) stipulated that the methodology section is paramount within a research process as it seeks to provide the answers pertaining to several sections incorporated within the research. Research studies seek to uncover the facts that have not yet been explored within a specific field of study. With the right methodology, any social scientific problem can be uncovered, therefore the study is able to derive fresh insights from the different experiences pertaining to the subject (Al-Khowaiter et al. 2014).

The purpose of this study is to investigate the extent to which the use of HRIS affects the functions of HRM and HR staff's effectiveness when carrying out their job-related activities and duties in Saudi Arabian public universities. This study adopts a mixed-method approach, thus using both quantitative and qualitative research techniques, which validate the means of triangulation in this research. Triangulation is a technique in which a combination of more than one method of data collection and research agenda are adopted in a study (Jakob 2001, Yeasmin & Rahman 2012). Thus, triangulation enables the researcher to use a combination of the advantages of quantitative and qualitative research techniques in order to answer the research questions. Moreover, combining multiple methods of research approaches and data collection methods can mitigate the weakness of one approach (Jakob 2001, Yeasmin & Rahman 2012). According to Jakob (2001), by combining multiple theories, observations and methods of data collection, researchers can minimise the weaknesses and biases that are associated with a single data collection method or technique. The aim of triangulation is to obtain confirmation of the findings through the convergence of different perspectives.

However, triangulation is not without limits; if a study is not clearly focused, theoretically or conceptually, the use of triangulation will not produce a satisfactory outcome (Yeasmin & Rahman, 2012). Secondly, triangulation may not be suitable for all research purposes because of time and cost constraints that may prevent its effective use. It involves combining different methods at the same time; these require expertise and resources that in most cases may not be available. Nevertheless, triangulation has vital advantages that promote productive research.

This chapter incorporates the choice of research paradigm, research design, data collection stages of the research, data analysis techniques employed, the reliability and validity of the data, and research ethics.

### **Research Aims and Key Objectives**

The study aims to find the extent to which the use of HRIS affects the functions of HRM and HR staff's effectiveness when carrying out their job-related activities and duties in Saudi Arabian public universities. It will use exploratory analysis, and explore the present level of use of HRIS in the HR Departments in the public universities in the KSA. In addition, the most applicable dimensions that will be measured in the second phase will be gathered through semi-structured interviews in the first part (qualitative method). This will establish the new dimensions of the HRIS use model in the socio-cultural framework of KSA. Finally, through explanatory research (a survey), the study will examine the workers' perception of the impact of the HRIS employed in the HR Departments in the public universities in KSA. This will enable us to judge the perceived effectiveness of the utilisation of HRIS, and to understand the link between HRIS and HR practices in this unique context. This information will be gathered by employing a survey technique in the second phase of information collection. Table 3.0 shows the objectives and the methods used to achieve the research methodology.

Table 3.0 Research methodology objectives and methods

Objectives		Method
Phase I	<ul style="list-style-type: none"> <li>To explore the current level of use and effectiveness of HRIS in Human Resource departments in Saudi public universities.</li> </ul>	Based on interviews
	<ul style="list-style-type: none"> <li>The second objective of Phase I was to explore the most appropriate dimensions that influence the use and adoption of HRIS in HR Departments in the public universities in Saudi Arabia</li> </ul>	
Phase II	<ul style="list-style-type: none"> <li>To propose a conceptual HRIS framework for examining the adoption and use of HRIS in the public universities of Saudi Arabia.</li> </ul>	Based on cross-sectional survey of HRM employees in the public universities in Saudi Arabia
	<ul style="list-style-type: none"> <li>To test empirically the proposed conceptual HRIS framework in the HRM departments of Saudi public Universities.</li> </ul>	
	<ul style="list-style-type: none"> <li>To evaluate the perceived effectiveness of the use of HRIS in Saudi public universities.</li> </ul>	
	<ul style="list-style-type: none"> <li>To provide organisational recommendations based on the finding of this study for the Saudi public universities.</li> </ul>	

### 3.2 Choice of an Appropriate Paradigm

A paradigm identifies the development and enhancement of scientific practice in relation to the developed philosophies and assumptions pertaining to the world, together with the nature of knowledge (Haverkamp and Young 2007). The paradigm therefore identifies the manner in which the research is carried out. The assumptions developed

include ontological and epistemological assumptions. Ontological assumptions refer to a branch of meta-physics that identifies an element of philosophy seeking to assess the nature of existence. Ontological assumptions place an emphasis on the nature of reality, and develop an understanding of the construction and representation of reality within the human consciousness (Ponterotto et al. 2013).

Epistemological assumptions refer to a branch of philosophy that studies the nature of knowledge through the identification of its sources. Epistemological assumptions study the process in which individuals create an understanding, together with a conceptualisation pertaining to the world around them. These are created through the development of assumptions pertaining to the aspects that constitute knowledge, and through the identification of its consequent construction and communication (Becker and Niehaves 2007).

Research philosophy identifies a pertinent aspect in relation to the conduct of research, as it has an immense impact on the manner in which research is conducted. Creswell (2002) stated that increased understanding of research philosophy clarifies research designs. It is therefore paramount to identify and select the most suitable philosophy at the inception of the research process, as it provides solid ground for the study.

Identification of the most suitable philosophy remains dependent on the association developed between the philosophy and the research questions pertaining to the thesis. Kura and Sulaiman (2012) identified four pertinent philosophies utilised in modern research; the critical social science paradigm, positivism, interpretivism and pragmatism. It is stipulated that all of these philosophical approaches provide both positive and negative impacts in various research contexts. The next three sections discuss these three research philosophies, starting with the positivism paradigm philosophy.

### **3.2.1 The Positivism Paradigm**

Positivism identifies a scientific method utilised in research. This philosophy incorporates realism as an element capable of expression from an objective standpoint. The positivist view explains that human behaviour is capable of being generalised. Positivism enhances the exploration of human behaviour in a similar way to that incorporated within natural science research (Johnson & Onwuegbuzie 2007).

Easterby-Smith et al. (2002) claimed that positivism enhances the accumulation of large amounts of data, within the provision of a detailed theoretical focus.

This paradigm follows the deterministic philosophy, and according to that view, causative relationships may be utilised as a way to link with various other theories. The more numeric measures based on observations that a theory incorporates, the more its standardised level increases, leading to greater replication of the results, and increased possibilities of testing and verification. This in turn increases the level of reliability of the theory. Creswell (2002) claims that this will help to remove the subjective influences of the researchers.

The positivist research model espouses a quantitative methodology. The realist/objectivist ontology and empiricist epistemology identified within the positivist model incorporate a research methodology that enhances objectivity and detachment, as it places immense emphasis on measuring the variables and testing hypotheses that are linked to general causal explanations (Silva 2007). It begins with the bigger world of ideas and ends up with the reduction of these ideas into small sets of discrete ideas to test, such as the development of research questions and hypotheses.

In this way, the positivism paradigm is a more rigid, scientific and quantitative approach and follows the deterministic and reductionist philosophies, which allow the researcher to test a theory. The process of research initiated by the positivistic paradigm begins with the formation of a theory and the collection of data (either to espouse or refute the developed theory). The final outcomes can be presented in their original or amended form, as supported by the nature of the knowledge collected about the real-world problem. The next section explains the concepts involved in the interpretivism paradigm.

### **3.2.3 The Interpretivism Paradigm**

Interpretivism incorporates an anti-positivism concept, where researchers identify reality as unstable and not realised from an objectified point of view (Creswell 2003). The interpretivist model incorporates two intellectual traditions: phenomenology and symbolic interactions. Phenomenology identifies the process that humans incorporate within their thoughts and that enhances understanding of the world. Symbolic interactionism identifies the idea that humans are continually seeking interpretations of the social world through the interpretation of actions by other individuals (Glazer &

Stein 2010). This enhances the adjustment of the identified meaning that pertains to the various actions incorporated.

The interpretivist philosophy stipulates that the researcher has to incorporate an empathetic stance. This provides a challenge, as the researcher enters into a new social world pertaining to the study's subjects, and investigators have to develop an understanding and interpretation of the occurring phenomenon from the subject's social point of view (Byrant et al. 2007). The interpretivist perspective is identified as highly applicable within business and management research, as it enhances research in various business fields, including organisational behaviour, marketing and HRM.

In contrast to positivism, interpretivism does not identify a reality independent from the human view. The interpretivism model identifies individual experiences as different realities, identifying the possible existence of more than one reality (Castro et al. 2011). This suggests that it is impossible to create generalisations, as they would limit the significance of the phenomena. Creswell (2007) explained that the interpretive perspective is interrelated to qualitative methods, as it enhances the flexibility of inquiry as opposed to the stipulation of questions.

From an ontological perspective, interpretive researchers are incapable of fathoming the existence of a reality that exists irrespective of people. Creswell (2002) said that they view reality as a human construct. The interpretive research model identifies reality and meaning as social constructs by emphasising people's capability to create a sense of their own social reality. Interpretive researchers utilise qualitative research methodologies to enhance the investigation, interpretation and description of social realities. Arthur et al. (2003) explained that the research findings pertaining to qualitative methodology incorporate descriptive reporting through the use of words.

Interpretive researchers emphasise the development of a better understanding of the world through provisions of primary experience. These are enhanced by factual reporting, together with quotations pertaining to actual conversations from insider perspectives, as opposed to testing the laws of human behaviour. Interpretive researchers incorporate data gathering methods sensitive to context (Hverkamp and Young 2007). This enhances the provision of a detailed description of social phenomena by encouraging participants to speak freely. Additionally, this enhances understanding of the investigator's quest for insights pertaining to a phenomenon

experienced by the participant. Interpretive researchers use forms of data gathering tools such as interviews, focus group discussions and naturalistic observations.

Crotty (1998) described several aspects of interpretivism:

1. In contrast to positivism, the researcher inductively develops the theory rather than beginning with the theory.
2. The researchers deliberately employ an open-ended questionnaire to delve into the views and opinions of the participants, as they directly interact with the world they intend to interpret.
3. The researcher draws conclusions based on the views of the participants, which rely on historical and social perspectives. The understanding about the settings or contexts of the respondents is gathered through visiting them personally.

The main objection given by positivists against the approach of the interpretivists is that they are not neutral, and bias may be involved in their analysis of meanings of contextual experiences because of the researcher's personal involvement with the participants. The interpretivist researcher may become emotionally attached to the world of the participants, and the interpretation of the meanings is likely to affect the researcher's outcomes. Furthermore, they develop subjective and multiple interpretations of the views, opinions, and experiences of the participants. This results in complexity of information and meanings. The researcher may draw out the meanings of their own choice; therefore, positivists cast doubts on the outcomes of interpretivist research.

In short, both positivism and interpretivism have their own merits and demerits. Therefore, there is a need to take a balanced approach and offer a constructive and pragmatic view about the world that is being investigated. The next section describes the pragmatic research philosophy.

### **3.2.4 Pragmatic Research Philosophy**

This section discusses the research philosophy that guides this study, which is a pragmatic research philosophy. This is because a pragmatic research philosophy analyses research findings based upon their social, moral and practical consequences, as well as their link to the human condition (Giacobbi, Poczwardowski and Hager 2005). Thus, the pragmatic research paradigm considers the problems under study and



the research questions as more important than the underlying philosophical assumptions of the method, which allows pragmatists to use more than one method (Cherryholmes 1992, Rorty 1982). Since this study uses both qualitative and quantitative methods of data collection, it is deemed appropriate to label the research philosophy underpinning this study as pragmatism.

Pragmatic research philosophy embraces mixed-method approaches, and it originates from the works of Peirce (1984) and Rorty (1990, 1991). Pragmatism is seen as the basis of mixed methods, and depending on the nature of the research, it can be adapted to yield better outcomes (Teddlie & Tashakkori 2003, Giacobbi et al. 2005). Therefore, the pragmatic research philosophy is adopted in this study, which embraces a mixed-method approach to the applied research questions under investigation. Researchers who have used the pragmatic research approach implicitly in their studies include Rallis and Rossman (2003); Teddlie and Tashakkori (2003); and Giacobbi et al. (2005). These authors did not explicitly state that they used a pragmatic research philosophy in their approach, however the method of data collection used incorporated both a quantitative and qualitative approach, which suggests that they are pragmatists.

Since this study is adopting both quantitative and qualitative approaches in the data collection, some features of the positivism and interpretivism approaches will be used under the umbrella of the pragmatist approach. The positivism approach suggests that reality is stable and can be observed and described from an objective viewpoint (Levin 1988). On the other hand, the interpretivists opine that it is through subjective interpretation of reality that a phenomenon can be fully understood (Thornhill et al. 2008). This study therefore calls for a pragmatic approach, which is associated with mixed methods of data collection and which this study adopts to overcome the weakness of using just one method.

The researcher has chosen the pragmatic paradigm for this study for the following reasons:

- It allows the researcher the liberty to choose the methods, techniques and procedures that befit the research issue under consideration.
- The approach also gives the researcher the freedom to consider either a qualitative or quantitative research method (or both), as the pragmatic worldview is not committed to any philosophy or reality. Following only the

qualitative or the quantitative method would have made it impossible to address the research questions of this study.

- For the current research issue, the world cannot be assumed to be a single entity, as a singular approach would likely narrow the broad vision of the researcher, who is required to grasp all the possible aspects of the world in order to build a broader picture of the events happening in it. This broad picture of the different dimensions of the world under investigation cannot be built by subscribing only to the quantitative or qualitative method.
- The current research deals with a mode of inquiry happening in social, political and historical contexts (the development of HRM adoption of HRIS), therefore only a pragmatic paradigm involving mixed methods is appropriate for addressing the research questions raised in the current study.
- Hence, the pragmatic paradigm can allow the researcher to utilise multiple methods, along with various assumptions and modes of data collection and analysis to answer the research questions.
- The researcher used this kind of approach because, in the first phase, we need to explore the level of technology used in Saudi Arabian public universities and their current situation in terms of HRIS applications. Learning about the current uses of HRIS through the outcomes of the first phase will help us to select the most appropriate dimensions that will be measured in the second phase. In the first phase, we used semi-structured interviews.

### **3.2.5 Inductive and Deductive Reasoning**

Logical thinking has been found extremely useful by the social science investigator owing to its ability to check the hypothesis, to generate new hypotheses and the objectivity of the findings drawn through this approach (Laird 1999). Babbie (2012) argued that logical thinking additionally helps to develop the hypotheses and research questions by finding the gaps in the existing studies. The deduction method refers to the set of reasoning used to reconstruct the arguments. In addition, another advantage presented by the deductive approach is that the investigator can simply use the observations and responses of the respondents to form new predictions in the area under investigation.

Nevertheless, the disadvantages of deductive research include the limitation imposed on the investigator to apply completely different thinking to the observations, and its inability to stimulate problem-solving and creative thinking (Creswell 2008). The scope of deductive approach within the wide selection of disciplines is narrow, and researchers have questioned its applications in the cognitive disciplines, due to the specific failure of this approach to furnish the interpretations of different levels of thinking of individuals.

In comparison with the deductive approach, the inductive approach permits flexible interpretation of the observations in numerous contexts in order to form knowledgeable decisions regarding the selection of research strategy and design. Additionally, it helps the investigator to mark the constraints of the research activities being administered to resolve a specific research issue. Moreover, it also provides the advantage of creating assumptions supported by the obtainable information, allowing creative thinking in terms of developing various solutions to tackle the research problem. It also enhances the emergent associations between the factors affecting the phenomenon under investigation (Tshakkori and Teddlie 2003). Similarly, Fox argues that the main advantage of inductive reasoning is that it permits the logical development of findings from the direct experiences of users/respondents participating in the study. This replicates the reality of the varied aspects of the research issue and involves a higher level of accuracy to form future predictions. In addition, the observations of the experiences are understood to construct the idea, which may be validated by using measurable observations and the deductive approach (Cargan 2007, Strauss and Corbin 2008).

The inductive approach is not without disadvantages. The findings obtained from the application of the inductive approach are not binding in nature, as contradictions could exist that result in the non-applicability of the findings to wider contexts. This shows that outcomes obtained from the inductive approach cannot be generalised (Fox 2008). This becomes problematic if the speculation established by the investigator is challenged by other researchers operating in same area of study in several socio-cultural contexts. Creswell (2008) notes that interpretations of the information obtained through the inductive approach are tough and time-overwhelming and need a certain level of expertise from the investigator to clarify the experiences and concepts of the users involved in the study.

In order to overcome the restrictions of both inductive and deductive approaches, this research used both approaches, particularly in multi-phasic data collection, to deal with the research problem under investigation. This allowed the investigator to gain in-depth understanding about the experiences and views of the utilisation of HRIS in the HR Departments of the public universities in the KSA. The deductive approach enabled the investigator to work out the varied dimensions of behaviour related to the use of HRIS, whereas the inductive approach allowed the investigator to determine the relationships between the dimensions of the HRIS use model quantitatively in the qualitative part of the study (part two of this study). The inductive approach refers to moving the reasoning process from general to specific; whereas in the deductive method the reasoning progresses from the particular to the general. Within the context of this research, the inductive approach enabled the investigator to draw out the factors affecting the pattern of use of HRIS, thereby helping to create a model of HRIS use for Saudi public universities.

### **3.3: Research Design and Strategy**

Research design is a way to process, collect and analyse evidence that enables the researcher to answer the investigative questions (Flick et al. 2004). The design covers almost every aspect of the research, from data collection to the techniques employed in data analysis. The research design involves the theoretical framework, the selection of empirical material, methods, procedures, goal generalisation, standards and control issues.

Christensen, Johnson, and Turner (2011) state that a research strategy encompasses the method that a researcher uses to develop a comprehensive sample for a research study. It comprises the identification of a suitable population and the selection of research samples from the population. The research strategy fundamentally focuses on the research techniques and methodology details (Tashakkori and Teddlie 2010). The research strategy comprises of a sequence of steps or actions required to perform the research. The research process initially begins with the definition of the study problem. The problem is then analysed by reviewing the theories and concepts associated with it. A review of research findings may have preceded the research. Thus, this study will seek to identify the limitations, similarities and gaps that existed in the findings established from prior research relative to the current research (Castro et al. 2010).

The subsequent process is the formulation of the research questions, depending on the form of research design and instrumentation that the researcher intends to apply. The data obtained in the research study is used to make a deduction, either agreeing or disagreeing with the hypothesis formulated. The process of designing the research follows the hypothesis, and a sample design is chosen that is deemed most appropriate. The execution of this design occurs by collecting the data in either primary or secondary forms. There are different techniques that are suited to the different research designs used to acquire the best results. The last step of the research strategy is data analysis and testing of the hypothesis, to establish whether there is any relationship that leads to the interpretation and reporting of the data that has been analysed.

### **Research design**

According to Creswell (2008), the qualitative approach is identified by the close proximity to the object of the research. It seeks to incorporate knowledge and to enhance the investigative and interpretive understanding of the phenomena through the provision of an inside perspective. The nature of qualitative data collection has various implications for the analysis, for example the non-standardised and complex nature of the data collected necessitates condensing.

This approach is advantageous as it enhances the direct contact between the researcher and the participant. It facilitates an adaptable approach to data collection, and also enhances the enquiry process by providing a better understanding of the issues affecting HR management. According to Castro et al. (2010), qualitative research enhances adaptability in comparison to quantitative research. According to Creswell (2003), qualitative research seeks the participants' thinking and enables identification of the most viable responses. Bryant (2007) identifies that the main disadvantage of this model concerns the generalisation of findings, which are varied, depending on the extraction and interpretation of the data.

Due to the nature of the research, the qualitative research design was adopted and incorporated within the paper. Following the qualitative research design, the study will be exploring the views, feelings and opinions of individuals with regard to the main subject under consideration in the research paper, using the appropriate and relevant literature (Nail 2005). The qualitative research approach will be used to achieve and fulfil the objectives.

### **3.3.1 The Qualitative Research Method**

Qualitative research seeks to provide an explanation and develop the understanding of the identified issue through the analysis of the respondents' views, opinions, attitudes and beliefs relating to the issue (Razali & Vrontis 2010). Qualitative research helps to identify the cause analysis relating to the subject matter. The analysis provides immense insight for the study, as it develops a better understanding of the psychological dimensions of respondent's responses towards certain elements relating to the study (Thomas et al. 2004).

The strength of qualitative research is its ability to provide complex textual descriptions of how people experience a given research issue. In this case, it enables the study to gain a better understanding of the underlying reasons and motivations relating to HR professionals and HRIS adoption in terms of how they use it and the impact it has on their jobs. Qualitative research techniques have the advantage of allowing participants to articulate their experiences in their own language and words; thus, it provides an understanding and description of how people personally experience phenomena. It is also useful for studying a limited number of cases by describing complex phenomena in depth (Brannen 1992, Saunders et al. 2009). Qualitative research techniques help to examine phenomena in considerable depth, but the collection and analysis of responses can be time-consuming and expensive, especially when they involve interviews that needed to be transcribed and analysed (Brannen 1992, Saunders et al. 2009).

### **3.3.2 The Quantitative Method**

Quantitative methods provide an important survey instrument for a wider coverage of the sample population and allow accurate data (variables) measurement. Quantitative methods are widely used in IS research for quantifying the impact of factors affecting the adoption rate or use of IS technologies in various organisational backgrounds (Kaplan and Duchon 1988). Therefore, the quantitative method needs to be applied to investigate the quantitative relationship between the dependent and independent variables of this study.

In quantitative research, data is analysed statistically in a numerical form (Fowler et al. 2013: p. 23). Creswell (2009:146) offers a definition of quantitative research method in

this way: “means for testing objective theories by examining the relationship among variables, which, in turn, can be measured, typically on instruments, so that the numbered data can be analysed using statistical procedures”. He adds to this by stating that quantitative research methods help to generate “assumptions about testing theories deductively, building in protections against bias, controlling for alternative explanations, and being able to generalise and replicate the findings”.

Moreover, the rationale behind the selection of the quantitative research method for the current research lies in its ability to confer the “deductive logic of the natural”, also called “social facts”, upon human behaviours (Amaratunga et al. 2002). Additionally, quantitative research methods find their use in the following types of research:

- ▶ Studies designed to compare and replicate the outcomes.
- ▶ Research based on facts in which the interpretations adhere to the facts, without involving the subjects being observed.
- ▶ Research that focuses on data analysis using objective methods rather than subjective methods (intuition, emotions, opinions and experiences).
- ▶ Research that aims to measure the descriptive aspects of human behaviour.
- ▶ Research demanding the need to design and verify the hypotheses.

This study tries to measure the descriptive aspects of human behaviour as they relate to HRIS use in the HR Departments of Saudi public universities, and it formulates the hypotheses and subsequently verifies them. Therefore, the quantitative research method is highly appropriate for this study. Furthermore, quantitative research methods have been applied by several studies reviewed in Chapter 2.

In addition, there is a need to use mixed methods, involving both qualitative and quantitative research, due to the merits and demerits associated with the qualitative and quantitative research methods individually. The rest of this chapter focuses on a discussion about the mixed-method research approach and the research design and strategies adopted for this study.

A comparison of the advantages and disadvantages of qualitative and quantitative methods as identified by previous researchers (Denzin and Lincoln 2005, Creswell 2009, Althonayan 2013) is described in Table 3.1.

Table 3.1. Advantages and Disadvantages of Quantitative and Qualitative Research

<b>Advantages of quantitative research</b> <ul style="list-style-type: none"> <li>• Allows for accurate measurement of variables</li> <li>• Structured and standard methods</li> <li>• Provides wide coverage of the range of situations</li> <li>• Large sample of the population</li> </ul>	<b>Disadvantages of quantitative research</b> <ul style="list-style-type: none"> <li>• Use of inflexible methods</li> <li>• Deterministic character</li> <li>• Disregards some important factors</li> <li>• Misses subjective aspects of human existence</li> <li>• Assumption of an objective truth</li> <li>• Generation of incomplete</li> </ul>
<b>Advantages of qualitative research</b> <ul style="list-style-type: none"> <li>• Enhances descriptions and theory development</li> <li>• Describes theories and experience</li> <li>• Allows deep understanding and insight</li> <li>• Holistic and humanistic</li> <li>• Exclusion of meaning and purpose</li> <li>• Flexible methods</li> </ul>	<b>Disadvantages of qualitative research</b> <ul style="list-style-type: none"> <li>• No hard data or clear measuring</li> <li>• Subjective, “non-scientific”</li> <li>• Deep involvement of researchers, increased risk of bias</li> <li>• Small samples</li> <li>• Generalisation limited to similar contexts and conditions</li> </ul>

### 3.4 The Mixed-method Approach

This research design involves both the qualitative and quantitative research methods in combination; this has become so increasingly prevalent in social sciences research that it has now been categorised as a third research approach. Jonson et al. (2007) describe the nineteen various definitions of the mixed-method approach; each of them is subtly different. However, all of them emphasise three important aspects: the use of more than one approach, data collection, and analysis of the collected data.

Tashakkori and Teddlie (2006: 3) provided a comprehensive definition of the mixed-method research design as “research in which the investigator collects and analyses



data, integrates the findings, and draws inferences using both qualitative and quantitative approaches and methods in a single study or a program of inquiry”.

Recently, the number of mixed-method approaches has increased due to the complexity of the research questions and the inability of a single paradigm to solve the research problem effectively (Leech and Onwuegbuzie 2009). Kelle (2006) elaborates on two important reasons for the choice of a mixed-method approach. First, the application of qualitative and quantitative methods in combination for a single research endeavour offsets the weaknesses and disadvantages arising from the exclusive use of either approach alone. This reduces the threats to the validity of the outcomes of the research. Second, a mixed method assists the researcher in achieving a full understanding and deep insight into the phenomenon under investigation through the complementary findings obtained from the qualitative and quantitative methods.

Although most research studies are either qualitative or quantitative, researchers have used the mixed-method approach less often to measure the impact of various factors involved with HRIS use. However, some HRIS studies have also been carried out using the mixed-method approach. The results offered by mixed-method studies can serve as good touchstones to determine the strengths of findings from studies that have used a single research method (either qualitative or quantitative). Furthermore, they should also provide the dimensions of the HRIS model with meanings, attributes and measured values to evaluate their influence on HRIS use (Kaplan and Cincinnati 1988).

In particular, the assessment of HRIS use within HR Departments of organisations requires an exploration of the factors or dimensions that are likely to influence HRIS use; this cannot be accomplished until the opinions and experiences of direct users of HRIS are explored deeply via a qualitative research approach. Similarly, the success model for HRIS use cannot be built and validated unless the measured effects of each of the constructs are determined through the application of a quantitative research approach. Furthermore, the use of a mixed research design will be helpful in evaluating HRIS use in contexts involving the organisational, social and political concerns of the research participants (Kaplan and Maxwell 2005).

In addition, the mixing of qualitative and qualitative approaches in the design does not mean the simple mixing of methods from different methodological traditions; in fact, it

requires the researcher to use both methods in tandem in such a way that the strength of the overall research outcome becomes greater than that of either the quantitative or qualitative research approach (Irani and Love, 2008). In short, the application of a mixed-method research design provides comprehensive information in relation to the cases or phenomena, thereby mitigating the weaknesses and biases related to the use of a single method. This increases the reliability and validity of the design, and makes the data more helpful and richer in terms of solving a particular research problem (Jonshon et al. 2007, Teddlie and Tashakkori 2003).

### **3.4.1 Potential Benefits of Mixed-method Studies**

According to Ponterotto, Mathews and Raughley (2013), the mixed-method approach offers several potential benefits to researchers as identified below:

- ❖ Mixed methods provide a valuable investigative tool as they integrate varied psychological topics within the different study areas. This enhances the study of a wide range of areas relating to a specific topic. This increases the scope of the study as it develops a larger data and analysis base, which provides more conclusive findings (Bryant 2007).
- ❖ There is an increased ability to match the purpose of the method to the stipulated need within the study, as the method provides a better understanding of the key issues espoused within the study (Ponterotto, Mathew and Raughley 2013). This is vital to the research as it enhances the analysis of the retrieved or available data from two avenues, which in turn allows more accurate identification of the valid results (Glazer and Stein 2010).
- ❖ This method enhances data triangulation, which validates the data utilised and identifies any high levels of variance in the data (Johnson and Onwuegbuzie 2007). This ensures that the utilised enhances levels of analysis to improve the review and subsequent analysis of the data retrieved and utilised within the study (Schmidt 2004).
- ❖ It enhances the development of a complementary relationship between qualitative and quantitative data, which provides high levels of clarity regarding either method within the study (Tashakkori and Teddlie 2010).
- ❖ In addition, the method incorporates an additional supplemental data set, which increases the efficiency levels realised within the research (Bryant 2007). This renders the method time-effective as limited time is utilised within the

operational process, enabling the identification of the required research findings within a limited period (Haverkamp and Young 2007).

- ❖ It increases the study's ability to provide well-articulated explanations of any identified complex or contradictory survey responses (Castro et al. 2010). This provides a better understanding of the aspects under study, in comparison with a single method (Glazer and Stein 2010).
- ❖ The utilisation of mixed methods enables the development of other unforeseen themes, which enhance the analysis process of the study (Ponterotto, Mathew and Raughley 2013). This helps to develop a conclusive research process, which enhances the identification of any unforeseen relationships between the elements relating to the process (Creswell 2007).
- ❖ The utilisation of mixed methods provides a researcher with immense levels of flexibility, which provides more accurate results pertaining to the subject under study. In addition, this provides the study with an opportunity to incorporate high levels of changes within the operating processes relating to the study (Onwuegbuzie and Collins 2007).

### **3.4.2 Challenges of Mixed-method Research**

Castro et al. (2010) identify several challenges that affect the utilisation of mixed methods. These include the following:

- ❖ It enhances the identification of increased levels of generalisation relating to the data, which enhances the provision of conflicting and at times complex data relating to the identified process (Schmidt 2004).
- ❖ The timing process relating to the identified sample may give rise to certain levels of conflict. This is because the time needed for the collection of qualitative data is not in line with the time needed for the collection of quantitative data, which compromises the research level and quality (Castro et al. 2010).
- ❖ In addition, the utilisation of both methods renders data compilation and analysis complex, as it necessitates the integration of two different forms of data. This may lead to time inefficiency within the process, which leads to identification of poor results related to the data identified (Tashakkori and Teddlie 2010).

- ❖ The data management process, together with the processing and analysing processes, are rendered complex by the compilation and analysis methods relating to the data under study (Haverkamp and Young 2007).

### **3.4.3 Past Research Studies Used Multiple Research Approach**

In previous studies, the quantitative method was predominantly used to build and evaluate HRIS use within organisational settings. These research works were conducted in different socio-cultural contexts with the aim of either building the model with the addition of new constructs, or to measure the relationships of various constructs with each other, using the quantitative method. For instance, both Ivori (2005) and Urbach (2010) employed the quantitative research method to evaluate the HRIS success model proposed by DeLone and McLean. Similarly, the quantitative research method was applied by other researchers to construct and validate the HRIS success model presented by DeLone and McLean (Wng et al. 2008, Ramezan 2011, Gorla et al. 2010) and it was used further to conduct “meta-analysis” in studies such as DeLone and McLean (1992, 2003), and Petter, DeLone and McLean (2009). This clearly shows that there is lack of application of the qualitative and/or mixed-method approach to build and validate the proposed model of HRIS use within the organisations. This may indicate that these models can be challenged in different socio-cultural environments, where the plethora of factors seem to interact with each other to affect the use and success of HRIS. Therefore, it is very important to elucidate these factors using the qualitative method, and to build the new model with the inclusion of pertinent factors/constructs from the existing models of HRIS. Validation of the proposed HRIS model needs to be then carried out within the organisational setting under consideration. This goal cannot be achieved without using the mixed-method approach (qualitative and quantitative methods).

### **3.5 Population**

For a research study to become valid and reliable, there is a need to obtain and analyse data, which are in turn transformed into a resource for the purpose of further studies and/or improvement in organisational strategies. The *population* refers to the prioritised targeted group selected to help the research be successful. Robson (2011) refers to a population consisting of almost everyone involved in the process of gathering

investigative data. He further explained that the population does not mean that a population includes a country or a state; rather, it should be restricted to the targeted object, phenomena or subject that is specific to the purpose of the sampling. The key target population for this study is HR staff and professionals who are regular HRIS users in their daily jobs, as they have a good understanding of the phenomenon under study. In addition, the HR professionals recruited for this study have HRIS administrative responsibilities in Saudi Arabian public universities and are experts in HRIS use.

The sample population for this research is segregated into two phases: Phase I for qualitative data analysis and Phase II for quantitative data analysis. Some researchers have indicated that a suitable sample size for a qualitative phenomenological research should be within the range of 6 to 30 participants (Srnk and Kaeszegi 2007). Other researchers suggest that a justifiable sample size for an interviewing process and data saturation should be between 10 and 13 (Francis et al. 2010).

**Therefore, for the qualitative Phase I**, the sample population consisted of 10 HR managers from the universities participating in this study; they were selected based on their experiences and capacity in their respective HR Departments at public universities. Therefore, they were able to provide an accurate and up-to-date, in-depth insight into their experiences with HRIS use. Similarly, **Phase II, which is the quantitative data collection phase**, involved 368 HR employees working as HRIS staff within the HR Departments in five public universities in Saudi Arabia.

### **3.5.1 Selection of Universities Participating in This Study**

Due to the high number of universities in Saudi Arabia, it would be difficult for the researcher to use all of them as a population, as it is financially and practically not feasible. Saudi Arabia consists of five regions, and each region contains many universities. Therefore, five universities were selected, one from each region as a representative for all the universities located in that region. It should also be noted that some regions contain only a single university, for example, the Al-Jouf region and the Hail region. Furthermore, each university represents a region with three modern universities and two classic universities. The selected sample universities were used for the selection of the participants and the population for both qualitative and quantitative data collection methods, respectively.

Apart from the regional criteria, the following criteria were also adopted for the selection of public universities:

1. Universities having well-established HR Departments.
2. Universities that have at least five years of experience of implementing HRIS in their HR Departments.
3. Universities with HR Departments that have made some investments through agreements with government agencies to boost their HRIS activities.

### ***3.5.2 Data Collection Methods, Sampling and Research Instruments***

This section initially outlines the data collection, and explains how the data collection proceeds in two phases, with each phase having a distinctive method of research. Phase I will adopt semi-structured interviews, and phase II data will be collected by the survey method.

#### ***Secondary Research***

Oppenheim (1992) defines analysis strategies as those used for information collection and analysis. There are two strategies for information collection, which can be utilised by any business.

Research: primary and secondary. Grinyer (2009) argues that secondary analysis is the further analysis of existing information, with future interpretation taking a unique kind of analysis for the secondary data.

Secondary information assortment strategies are all the sources that exist so that the researcher can obtain the required information for research. Using the compartmentalisation followed by Saunders et al. (2007), secondary information is often categorised as documentary versus survey.

Documentary information embraces written data (e.g. reports, journals, and books) and non-written data (e.g. tv programmes and CD-ROMs). The value of secondary analysis during this PhD study is that it helps to clarify the analysis queries. As Collins (2010) notes, this allows the investigator to derive vital facts and patterns from previous analysis (Kamins 1993), and uncover areas where less analysis has been undertaken. Thus, it helps to outline the initial analysis agenda. Housden (2005) notes that secondary information is often low cost or free of charge, and saves effort and time.

Equally, Collins (2010) sees secondary analysis as a route with quick access to ‘desired’ information.

The search terms and key words were identified by reading through articles on the impact of HR systems on HRM in reviewed journals and management textbooks, which was the initial step of the literature review. The search strategy was broad and used key words, like HRIS, Impact of HRIS, HRIS adoption and use, the adoption and use of technology in HRM, e-government, Arab, IT within public organisations in Asian country. Coventry University’s student portal (Library), which has a rich collection of journals from credible databases such as EBSCO, Journal of the Association for Information Systems (JAIS), Business Source Complete, Sage, Journal of Management Information Systems (JMIS), International Journal of Human Resource Management, European Journal of Information Systems, Management Information Systems Quarterly (MISQ), Journal of Information Science, Information Systems Research (ISR), ACM Transactions on Management Information Systems, and Emerald. Online journals were accessed through this student portal. This resulted in reports that highlighted current HRIS and HRM studies and educational sources. Because the method was concentrated, the choice of sources centred on areas of specific educational interest, such human resource systems, IT/IS use and adoption, HRIS and HRM search and analysis, and also the information search method, IS models, and HRMS. All the selected articles had to be written in the English language.

### **3.6 Data Collection for Qualitative Phase I**

In the phase I of the study (qualitative phase), purposive sampling, a non-probability sampling, was used. Purpose sampling only focuses on the characteristics of the sample population of interest, which can be considered by the researcher to address the research problem and aims of the study (Stake, 2010). In the context of the current study, the following characteristics of the sample population were targeted for the selection of the sample population through the use of the purposive sampling technique: the experience of the HRIS users, the level of technology and engagement of users with the available HRIS tools, and the size and region of the public universities in Saudi Arabia. The purposive sample also helped the researcher to select only those universities with HR Departments that were using the HRIS and had extensive experience in the use of HRIS.

The recruitment of the interviewees started by first sending a letter and information to HR officials working in the five selected public universities. The five universities consist of three contemporary universities and two old or traditional universities; this is to allow balanced views on HRIS adoption and use from both modern and old universities. The same criteria were used to select the sample population for the quantitative phase II.

Based on the communication and recruitment process with the potential participants, 10 HR professionals and managers from the five public-funded universities were selected based on their experiences, capacity and authority in the overall activities of the HR Departments of the relevant universities (Table 3.2). Therefore, they were able to provide an accurate, up-to-date, and in-depth insight into their experiences with HRIS use.

Table 3.2. Participants by Job Titles and Institution (HR Departments Professional)

No	Position	University Name
P1	HR Manager	Shaqla University
P2	HR and Programme Officer	Hail University
P3	Dean of Employee Affairs	Al-Jouf University
P4	HR Manager	Qassim university
P5	HR Manager	Northern Borders university
P6	HR Manager	Al-Jouf University
P7	HR and Lecturers Manager	Shaqla University
P8	HR and Lecturers Manager	Northern Borders university
P9	HR Manager	Hail University
P10	HR and Lecturers Manager	Qassim university

### 3.7 Data Collection for Quantitative Phase II

The second phase of the study was the quantitative research approach stage. This involved soliciting information on the adoption, use and effectiveness of HRIS from



368 HR staff and professionals through survey questionnaires. The questionnaires were prepared and uploaded onto the Bristol Survey web site. The link was sent to individual participants to complete the survey questionnaire via their HR managers. The responses from the interview stage informed the development of the questionnaires for this study. The next section discusses the sampling techniques used to select participants for this study.

## **Design of Interviews**

### **3.8 Semi-Structured Interviews**

Rubin and Rubin (2011) argue that the best way to understand people is by listening to them, seeing how they view their world and live their lives; thus, the interview technique may be a rich tool for in-depth information collection. Basically, an interview may be an oral communication where individuals talk about their lived world, state their opinions in their own words, and express views on a given phenomenon. Stake (2010) explains that a qualitative interview tries to know the world of the research participant, whereas Merriam (2009) defines an interview simply as a spoken research technique. In additional educational terms, an interview could be a spoken communication between two individuals for the purpose of identifying relevant research information, which is guided by specific research objectives (Gill, Stewart, Treasure and Chadwick 2008).

There were three main reasons for using an interview methodology in part I of these studies. The first was that it provided flexibility that a structured questionnaire could not give; it allowed the enquirer the liberty to investigate and question the responses, feelings and concepts given by the person being interviewed. Also, exclusively written responses, such as in those gathered in surveys, do not account for the human aspect of questioning, such as the facial features, tone of voice, hesitation etc. This was necessary when working with professionals in the Saudi context, where implicit knowledge is required. While a response in an interview can be clarified, responses from a questionnaire have to be taken at face value (Bell 2005). Second, Phella, Bloch and Seale (2011) note that an interview offers the opportunity to clarify the question for the respondent when it is not understood. In this study, it helped to elicit specific answers from identified respondents (such as managers of HRM), who gave relevant information on their perceptions and experience of using HRIS. The interview

technique helped the investigator to shape the context and the environment within which the interview materialised. Stake (2010) notes how interviews have a high response rate and are versatile in providing both different types of questions and also the clarification of respondents' answers. In addition, they give the investigator the ability to easily change the sequence of the questions. Third, Connaway and Powell (2010) establish their value as a way of obtaining a large amount of information and interacting with the research topic within a restricted period. The semi-structured interview technique in the first part of this research investigates and explores the current level of use of HRIS in HR Departments in Saudi Arabia public universities. The content of the interviews is used to choose the most appropriate dimensions, which will be measured in the second part. Therefore, there is a requirement for detailed information to understand the development. According to Gill, Treasure and Chadwick (2008), the prime purpose of research interviews is to explore the experiences, views, motivations and beliefs of people on a specific research problem.

The interviews constitute an important part of the research process for soliciting in-depth information and data from the participants of the study (Yin 2013). Denzin and Lincoln (2005) described the use of various types of interviews and their respective advantages and disadvantages, depending on the research problem being addressed by the research. The different types include unstructured, structured, semi-structured, gender, group, post-modern, interpreting and framing interviews. According to Seidman (2013), open-ended or unstructured interviews provide the freedom to determine the direction of research, whereas structured interviews provide a pre-determined list of questions to be answered by the interviewees. However, semi-structured interviews involve the placing of structured and unstructured questions within the interview questionnaire, and the researcher enjoys complete freedom to ask questions in different ways to elicit the maximum information about a certain phenomenon. Furthermore, they offset the disadvantages of structured and unstructured questions when they are used alone during the research process (Corbin, & Strauss 2014, Glazer & Stein 2010).

In addition, semi-structured interviews allow two-way communication between the researcher and the interviewees; therefore, they are considered to be less intrusive. This type of interview method also allows the researcher to have knowledge of what is already known and to gain deep insight into what is unknown. The interviewees have a

better opportunity to discuss sensitive issues with the researcher during the semi-structured interview process (Hermanns 2004, Myers & Newman 2007).

Due to the aforementioned benefits, the use of semi-structured interviews for this research holds critical importance (Longhurst 2003).

Additional benefits of the semi-structured interview method is that it allows the researcher to develop well-defined and well-structured interviews including the tools to gather all aspects of necessary information. This can provide useful and systematic information to solve the research problem under investigation (Castro et al. 2011). Furthermore, the flexibility of the structure of the semi-structured interviews helps the researcher to include the qualitative and quantitative data from the target respondents through the inclusion of open-ended and closed-ended questions. The closed-ended questions elicit the information targeted by the researchers, while the open-ended questions assist them with gathering the opinions and experiences of the respondents within a specific context. This can further help to develop the models and frameworks to address the research problem (Glazer and Stein 2010).

Semi-structured interviews are also instrumental for increasing the understanding about the social phenomenon, occurrence of events and processes within the society that carry some critical importance for further development of society. This is mainly because of the liberty exercised by the respondents taking part in a study using semi-structured interviews (Castro et al. 2011).

In the context of the current study, the use of semi-structured interviews facilitated the provision of in-depth opinions, views, and experiences of the respondents about the use of HRIS in HR Departments of Saudi public universities. This provided the foundation stone for the formulation and validation of a HRIS framework involving several factors that influence the use and adoption of HRIS in Saudi universities. The elicitation of important external and environmental factors influencing the use of HRIS within Saudi universities was made possible through the use of semi-structured interviews with the professionals directly dealing with HRIS tools within the HR Departments of these universities.

On the negative side, semi-structured interviews may result in a lack of trust and time. In most cases, the interviewer is a total stranger to the interviewee, and this can lead to

concern on the part of the interviewee with regard to how much the interviewer can be trusted. This means that the interviewee may choose not to divulge much information that he or she considers to be sensitive (Hermanns 2004, Myers and Newman 2007). Moreover, these interviews are conducted within a limited period of time; consequently, participants have to come up with their opinions under time constraints. In such situations, the data gathered may not be reliable, as these opinions were made over a limited time period (Hermanns 2004, Myers and Newman 2007).

**Table 3.3: Interview Questions: Phase One**

Question	Probes	Follow Up	Dimensions
<b>1.</b> Could you introduce yourself ?.	Can you tell me more about your self ?		Personal details
<b>2.</b> How long have you been doing this job?.	Could you please tell me more about your department ?		Organisation Background
<b>3.</b> Please tell me about your job?.			Role description
<b>4.</b> What kind of HRIS are used in your University, and how do you evaluate the HRIS as a user?	Could you please give me some reasons for low or high (based on answer) use of HRIS?	How important is the HRIS in your university?	Organisation cycle life in adapting and using HRIS
<b>5.</b> What are the reasons for adopting HRIS?.	Could you give me some examples ?		Motivations
<b>6.</b> Which factors enhanced the implementation of HRIS in your University?.	Why is that?		Factors affecting HRIS implementation
<b>7.</b> Which factors have hindered your University for adopting HRIS in your University?.	Why is that?		Factors that obstruct
<b>8.</b> What lessons did you learn( about the system and implementation) during the adoption of HRIS in your University?			Experience in using HRIS
<b>9.</b> Can you explain the implication and/or organizational changes arising from HRIS adoption in your University?	Could you give me some examples ?		Past experience
<b>10.</b> Are there any other issues concerning HRIS adoption that have not been covered in this interview and that you wish to bring to our attention?		Examples of problems faced during use	Additional issues with HRIS adoption

### 3.8.1 The Interview Process

This study conducted ten interviews with HR professionals and managers. The interviews examined how HR professionals and managers adopt and use HRIS to

perform HR functions. The profiles of the participants included HR managers, HR and lecturer managers, a HR programme officer and a Dean of Employee Affairs. The HR professionals selected for this research all use HRIS in one way or the other to carry out their day-to-day HR functions, and they share an in-depth understanding of the issues relating to HRIS adoption and use in their institutions.

Each interview section lasted approximately 30 minutes. Interviews were held in the participants' offices, as this allowed them to recall and describe their use of HRIS and share this in context. This also allowed the interviewer to gain a firsthand view of how HRIS use fits into their work environment. These interviews were considered necessary because they provided initial data on how HRIS is adopted and used in Saudi Arabian universities. Semi-structured interviews were used to enable the researcher to delve deeply into why universities adopt HRIS for managing HR. Other researchers who have used interviews in the context of HRIS use in HRM include Troshani, Jerram and Hill (2010).

The initial questions focused on HR professionals' job roles and their length of time in their positions. Next, they were asked what kinds of HRIS they used in their institutions; this was to identify the types of platforms they hosted. Other questions were about the reasons for HRIS adoption and use, factors that facilitated the implementation of HRIS, and lessons learned from adopting their HRIS. In addition, the questions involved the changes that have occurred in the organisation as a result of HRIS adoption and the implications for the organisation (see Appendix C for a copy of the questions).

The interviews were conducted in Arabic and audio-recorded and handwritten notes were taken where appropriate to aid the analysis. The recordings were transcribed verbatim and later translated into English for analysis by the principal researcher of this study. The researcher has advanced knowledge in Arabic and has taught HRM modules for more than five years in Arabic. To ensure the validity and credibility of the transcription, a third-party language expert was hired to confirm the validity of the transcripts. The transcribed interview was imported into Nvivo 10 software for analysis (see Appendices for consent forms and participant information sheet).

The next section discusses the data analysis of the interviews, which involves an analysis of the transcribed interviews to extract meaning out of the participants' responses.

### **3.8.2 Qualitative Data Analysis**

According to Creswell (2013), data analysis in qualitative research involves formulating and classifying the data transcripts into smaller and simpler themes for analysis. This is done in the form of coding; the codes are matched to frequencies and interrelated to categories of an analytical framework to produce the research.

The interviews were transcribed and imported into Nvivo 10 software and coded with memos, and the annotations were developed to identify the themes. In addition, elements in the interview transcript were thought through carefully and reflected upon, and the items were linked together with the content of the responses to develop themes. The categorisation of the codes into themes and the interpretation of the themes developed are based on the approach used by Nunes, Greenberg and Neustaedter (2009), Troshani et al. (2010), and Al-Shibly (2011). The coding and categorisation led to eight themes on the reasons for and challenges of HRIS adoption. Open coding was used to analyse the data to generate a large number of codes (Strauss & Corbin 1998). The codes reflected the views of the respondents for HRIS adoption and use, as well as the hindrances and factors that facilitated HRIS adoption in Saudi universities. Open coding was used to code the transcribed interviews because it allowed a line-by-line coding of concepts and ideas, and the development of categories based on the properties and dimensions of the responses. In addition, open coding also helped in the analysis of the qualitative data (Corbin and Strauss 2014).

After the open coding of the interviews, affinity diagramming was used to categorise these codes in order to develop important themes. An affinity diagram is a tool that helps to collect large amounts of data in the form of issues, opinions and ideas, and puts them together into similar groupings based on similar relationships. Thus, the affinity diagramming process can also be used to group and classify ideas generated from brainstorming (Holtzblatt et al. 2004). Other authors who have used open coding methods and an affinity diagram to analyse data include Nunes, Greenberg and Neustaedter (2009), and Troshani, Jerram and Hill (2010). Even though Troshani, Jerram and Hill (2010) used an affinity diagram process to develop their themes in their research, this was not explicitly stated.

However, more detail will be provided on the qualitative data analysis in the next section with regard to thematic analysis. At this point, the data is ready for interpretation

and analysis, which will follow in the next chapter, along with a justification of why thematic analysis was used among other analytical approaches.

### **Thematic analysis**

Thematic analysis is set of procedures in phases or stages for describing content based on themes (Oliveira et al. 2013). Thematic analysis consists of six phases (Braun and Clarke 2006) or three stages (Bardin 2009). This work will adopt Bardin's three stages: 1) pre-analysis, 2) exploration and 3) treatment and interpretation. The pre-analysis stage defines the objective of the content, classifying the material in relation to the goal based on the relevance of the material, carefully reading the material to be examined, and organising the material. This stage also entails knowing the file format that can be used with the qualitative data analysis software. The exploration stage determines the units of analysis, therefore it entails identifying elements – these are the parts of the text that contain the code. The unit of analysis can be theme, paragraph or word. Coding is seen as a process of categorising and indexing a text. This will build a structure upon which thematic ideas can be established (Gibbs 2009: 60).

The last stage is treatment and interpretation, where the content is coded then inferences can be drawn from it. However, this stage can be biased by the researcher. In order to mitigate this problem, the reliability of the coding is checked. There are three ways to check the reliability of the coding: 1) stability, which involves the same person repeating the process; 2) reproducibility, which entails a different person repeating the process; and 3) accuracy, which is when the result is compared to a standard (Krippendorff 1980, Weber 1990). It is important to check the way in which the data analysis software displays the text associated with each of the codes and categories, as well as the tables and figures generated by the software.

There are various qualitative data analysis software tools used for thematic analysis such as MAXQDA, Nvivo, and ATLAS (Oliveira et al. 2013). This research will adopt the Nvivo tool for various reasons: a) it speeds up the process; b) it enhances the rigour; c) it provides more flexible data analysis from different perspectives; d) it facilitates the exchange and reproduction of data; and e) it allows the researcher to reflect in greater depth by reducing the operational activities (Bardin 2009). Nvivo is a software package for digitally coding texts or images that allow the user to synchronise evidence



and make analytically richer intersections (Teixeira 2009). This enables the researcher to manage the empirical material in a single location (text, spreadsheets, audio, video or images) and data can be added, modified, connected and cross-referenced.

The data was collected from the ten respondents interviewed. The interviewees were experts in various HR Departments in five public universities in Saudi Arabia, with many years of experience ranging from eight to twenty years. The interviews were all recorded and transcribed. Caution was applied to ensure that the transcription process was accurate and precise, and another person verified, checked and validated the transcribed content. To begin the coding process, it was decided to involve an independent person who knew how to use Nvivo and had a deep understanding of thematic analysis, and it was agreed that the same transcribed data would be coded independently. This was necessary to ensure consistency among the raters. Once the transcribed data was coded, a comparison was made to determine the level of agreement between the coders. After agreement, cross-referencing took place of the themes that emerged from the transcribed data. This process was repeated to mitigate any bias from this research and to maintain the integrity of the work. After that, the researcher encouraged each coder to identify any new themes that may not have been identified through the whole process. This provided confidence in the codes and enabled the research to proceed with the analysis of the transcripts consistently.

The codes and themes developed by the above mentioned approach have been shown in the Table below:

Table 3.4. Codes and themes developed from the interviews.

Themes	Codes	Sources	References
Usefulness	Ability to obtain reports	6	12
	Usefulness	7	21
	Helps to perform HR functions	8	11
	Time-saving	7	15
	Cost-saving	6	11
	Storage of large volumes of data	6	8
	Ability to obtain data quickly	10	9
	Facilitates work procedures	6	13
	Helps in training and recruitment	8	8
Speeds up decision making	Leads to quick decision making	6	9
	Helps to make decisions quickly	7	21
System quality	Ability of the system archive to store a huge amount of data and employee information at the same time	6	33
	Ease of use of the system	8	11
	System is old and employees are not willing to use it	7	16
	Error in data generation	6	12
Ease of use of system	It is easy to use?	5	16
	It is easy to use in organising work and procedures?	3	29
Subjective norm	Employees not willing to use the system because of other pressures	9	32
User satisfaction	System is old and employees are not willing to use it	8	7
	Satisfied with the system	5	15
	System is old and slow and affects usage	8	17
	Not able to do work efficiently	9	10
Unification of system	Develops policy to help unified HRIS for all universities	10	10
Hindrances in adoption of HRIS	Difficult to use	7	19
	Error in data generation	9	16
	High cost of maintenance	8	32
	HR professionals were not involved in design of HRIS	6	41
	Lack of familiarity of the system	4	21
	Inappropriate system	9	24
	Limited benefits	6	12
	System is old and slow	6	24

### 3.9 Second Phase: Quantitative Research

This section presents a discussion on the quantitative stage of this study. To identify the factors that impact HRIS adoption and use in Saudi public universities, this study proposed a HRIS adoption model to be tested in Saudi Arabia. It has developed hypotheses concerning the impact of various constructs of the proposed model on HRIS, as discussed in detail in Chapter 2 (2.11).

#### **3.9.1 Population for the Quantitative Phase**

The quantitative data collection was done through an online survey that was sent to 368 HR employees working at HR Departments in the five selected public universities in Saudi Arabia. The questionnaire was written in the English language, because it is a language understood by all the HR employees. It took two months to collect the data during this phase, and a total of two hundred and fifty responses were received. This was approximately a 68 per cent response rate which is deemed significant for the purpose of this research. This represents the quantitative part of this research. The selection of the sample was derived on a regional basis so that all parts of the country were represented.

##### ***3.9.2.1 Questionnaire Development***

As indicated in the literature review, no studies have investigated HRIS usage in Saudi public universities. However, other studies have researched IS success and HRIS adoption and use in other countries, and they provided rich literature which was reviewed and formed the basis of the questionnaire development in this study.

The measurement instrument used in the second phase of this study was developed by adapting existing validated instruments used by DeLone and McLean (2003) and Urbach, Smolnik and Riempp (2010). This helped to delve into the subject matter and to elicit answers about some of the mixed and inconsistent results that came out of the interview phase in terms of system quality, information quality, use, user satisfaction, service quality, usefulness and subjective norms.

The development stage of the questionnaire requires a thorough planning process involving carefully checking and revising its contents. According to Fayers and Hays (2005), it is crucial for the principal investigator to take into account the length of the developed survey questionnaire and the ease of its completion before it has been issued

to the respondents. Guidelines, which can be used for reference when developing appropriate questionnaires, have been developed by various researchers such as De Vaus (2002). According to De Vaus (2002), the following critical points should be taken into consideration when developing a questionnaire:

- i. The use of technical terms should be strictly avoided. Instead, simple terms that can be easily understood should be used.
- ii. The use of questions having two parts, also known as double-barreled questions, should be avoided.
- iii. Questions that seem too long should also be avoided. Rather, the investigator should ask simple questions that can be answered easily by the respondents.
- iv. If questions having multiple choices are incorporated in the questionnaire, the investigator should make sure that all the possibilities are included.
- v. Lastly, De Vaus advises that it is critical to observe a naturally logic order to assist respondents in completing the questions in a stepwise manner, using minimal effort or energy as well as time.

These steps were carefully considered in order to allow the presentation of unambiguous and valid questions, as was previously suggested for the development of an appropriate questionnaire for use in this kind of study (Churchill and Iacobucci, 2009). This study adopted the use of a closed questionnaire type. Through this questionnaire, the respondents were allowed, as well as motivated, to choose the answer that best suited the options they had in their minds. This reasons for selecting this kind of questionnaire were four principal benefits associated with its adoption, as summarised in a study conducted by Foddy (1994). The first advantage entails the provision of responses that have been set in advance and this gives room for collection of standardised responses, which consequently facilitates the development of meaningful comparisons among the responses given. The second advantage is presented by the characteristic of closed-ended questions, which are quick to answer. Essentially, coding of the answers generated by the respondents is a quick and easy process. Additionally, coding of the answers offers the advantage of quick computerisation of results as well as analysis. The third advantage involves the absence of the aspect of discrimination against respondents who seem not to talk or articulate much. The last advantage involves the attribute of presentation of a recognition task, not a recall task. Due to this characteristic of closed-ended questionnaires, the

respondents find it easier to handle the content presented in the respective questionnaires (Foddy, 1994). The scope of the questions included in the questionnaire covered several aspects of the topic under investigation. The instrument used in this research consists of two parts. The first part collected basic demographic data on the respondents. Data on age, education and tenure at the universities were collected. In addition, data on computer skills and the frequency of HRIS usage were collected.

The second part of the questionnaire was designed to collect data about the participants' assessments and use of HRIS. The questions incorporated in this section were closed-ended questions and were focused on the following aspects: system quality, information quality, service quality, subjective norm, use, user satisfaction and organisational benefit

### ***3.9.2.2 Questionnaire Coding***

While utilising online surveys or self-issued survey approaches, it is paramount to employ Likert scales as stipulated by Hair et al. (2006). From a definitional perspective, a Likert scale is a measure employed when asking the participants to specify their opinions (in terms of agreement or disagreement) regarding a certain area of study (Hair et al. 2006). This happens by providing ratings to a sequence of belief statements perceived through the behaviour or mental provisions.

For the current questionnaire, a 5-point coded Likert scale was utilised. It ranged from “strongly disagree” to “strongly agree” in the order of 1 through to 5. This was as portrayed below:

Strongly Disagree (Option 1)

Disagree (Option 2)

Neutral (Option 3)

Agree (Option 4)

Strongly Agree (Option 5)

The above scale has previously been utilised in a wide range of similar researches. This approach provides the researcher with several probable scores, as well as elevating the available statistical breakdown (Premkumar and Ramamurthy 1995, Pallant 2007).

### ***3.9.2.3 Primary data collection using online survey***

The survey, consistent with Powell and Hermann (2000), is considered to be a scientific and standardised approach for collection of information from the individuals participating in the study. Survey methodology is thus helpful for ensuring the transparency of information collected from the respondents, and the accuracy of the information matching with the particular research issue. Additionally, the survey is found to be helpful in constructing the quantitative aspects of the attributes or dimensions in reference to defining the behaviour of individuals towards specific developments (Halbesleben and Whitman 2013).

Similarly, Wild and Diggines (2010) and Babbie (2012) support the use of Internet surveys as a cost-effective tool to collect information from respondents situated in remote locations. Online surveys facilitate the recruitment of respondents with executive posts as they are often reluctant to provide face-to-face appointments to fill in the questionnaire, owing to their busy schedule. Since this research involves HRIS professionals with executive posts in the HR Departments of their respective public universities, the Internet survey gave the investigator the opportunity to collect the desired information from the participants. Online surveys can even increase the consistency of data and the dependability of information by including as many participants as necessary to deal with the research issue (Clark et al. 2008).

However, in an online survey, the respondents might leave some questions unanswered that are necessary for finding the correct solutions to the research problem; this is the one of the drawbacks of online surveys (Marsden and Wright 2010).

Key objectives in phase II of this research were:

- To evaluate the perceived effectiveness of the use of HRIS in Saudi public universities.
- To understand the relationship between HRIS and Human Resource practices in Saudi universities.
- To empirically test and validate the proposed conceptual model.
- To provide managerial recommendations based on the findings of Phase II.

An online survey was the main source of data collection for this study with the intent of verifying the hypotheses concerning the use of HRIS within HR Departments of Saudi Arabia public universities. Longitudinal and cross-sectional surveys are the two typical types of expressive survey study approaches. For a cross-sectional survey, the study can be equated to a snapshot of a phenomenon, and data is gathered from a selected sample to represent a huge population (Pedhazur and Schmelkin 1991). Such an assessment can be utilised not only for description purposes, but equally for determining the connections between variables (Babbie 2010). In a longitudinal survey, the gathering of data is done using an identical sample but at various times, with the intent of assessing changes in the elements over time (McGivern 2006). This research approach (longitudinal) is considered costly and laden with huge intricacies due to the lengthy periods needed to conduct such surveys (Pedhazur and Pedhazur-Schmelkin 1991). Actually, this survey type needs regular follow-ups on the research participants, making it difficult, or even impossible, to involve a large sample size (Pedhazur and Schmelkin 1991).

Furthermore, control samples are not included in longitudinal surveys, and experiencing case losses can be a serious setback, resulting in predisposition in the overall findings and results. The current study never considered the use of longitudinal research due to the limited availability of funds as well as the time limitation. Instead, a cross-sectional survey incorporating self-completion questionnaires was considered the most appropriate approach for data collection. Consequently, these questionnaires (online) were employed to collect the necessary information on the use of HRIS in HR Departments of the public universities in the KSA, and to perceive the impact of independent variables and their stipulated relationships on HRIS use and net organisational benefit. The questionnaire design was supported and facilitated by the interview responses as well as the reviewed literature.

#### ***3.9.2.4 The Use of the Questionnaire***

The use of the survey research approach, as well as pragmatic quantitative approaches, tend to be the most widely employed methods of data collection for the use and adoption of HRIS (Williams et al. 2009). The main justification behind this stipulation is that such a survey approach aids in assessing the relationships between variables, as well as generating models of such relationships. According to Saunders et al. (2009), researchers tend to observe surveys as being generally authoritative. Another

significant benefit associated with surveys is that they are able to reach a huge sample hence can collect reliable data (Jankowicz 2005). Questionnaires can be easily distributed via personal administration or by emailing them to the participants (Oppenheim 2000). The section below discusses the key benefits and demerits associated with online surveys compared to other survey formats, as provided by Evans and Mathur (2005).

For an online survey, flexibility is highly exercised hence it is regarded as an apposite tool. This means that it can be conducted in a number of ways such as emailing the survey via a link; sending an email with the survey embedded; or visiting a webpage that hosts the survey, among others. Respondents equally find it convenient to take online surveys rather than being bothered by regular phone calls, which end up wasting much of the respondents' worthy time. This equally gives the participants the freedom of choice, as they are able to choose the best time for participating, as well as ensuring that they have sufficient time to contemplate the best answer. This can result in increased reliability and efficiency of the research findings. Worthy of mention is the fact that online surveys provide the participant with increased comfort and privacy, due to the absence of the interviewer.

From a general perspective, an online survey is a simple way to study participants and obtain their feedback, which can be recorded and analysed when required. Furthermore, the cost incurred in such surveys is low compared to other approaches. Presently, with development and progression in HRIS, several online firms have been able to offer online survey services by generating such surveys automatically. Such surveys are easily conducted, recorded, and tabulated, hence minimising the costs that could have otherwise have been utilised in creating several questionnaires. Since the current study embraced self-issued surveys, no training or travel costs were incurred, hence minimising the overall processing and analysing costs (Frankfort and Nachmias 2007). Ultimately, the follow-up procedure is relatively simple and affordable. Courtesy of the minimal charges incurred in sending emails and the general simplicity of the whole process, researchers are able to facilitate follow-up exercises as a way of elevating the response rate of the participants.

When they are not appropriately tackled, online surveys can equally exhibit potential faults and flaws. According to Frankfort and Nachmias (2007), in most Internet surveys,



the researchers are required to pay certain attention to the level to which the respondents are representative of the target population. Additionally, the sampling method for online assessments is not such a simple task (Schonlau et al. 2002). The key probable issue concerning sample execution is the likelihood of someone who is not serious responding to the survey. From their study, Evans and Mathur (2005) provided the key potential flaws witnessed while conducting online surveys. To begin with, among the most criticised approaches of sample selection are 'volunteer' samples and blanket e-mailing samples, since the researcher is unable to control the participants and guide them on how to best complete the survey. Actually having the same email sent to multiple recipients (respondents/participants) would not be the best approach since it would appear to the recipient (participant) to be spam. With 'volunteer' samples, individuals are able to access websites and aggressively join and contribute to the questionnaire. Respondents with limited expertise in online surveys can be highly challenged by the exercise and end up providing irrelevant or unreliable data.

Equally, even though online surveys are seemingly on the rise, there would still be several hitches and setbacks due to limited expertise and familiarity with advanced HRIS applications. The fact that there are diverse OS (operating systems) and several types and forms of web browsers would equally be another challenging factor. This not only has an impact on the accessibility issue but also the appearance of the questionnaire on the screen. Equally, due to the fact that online surveys are self-issued and there is no physical human contact, it is paramount to ensure that clarity is achieved while giving the instructions. For such reasons, it is important for the researching team to opt for a viable web-based instrument to create a questionnaire that entails simple and comprehensible questions and guidelines. Furthermore, security and privacy issues are key issues in questionnaire surveys. The privacy and informational consent of the participants remain paramount. Studies by Schonlau et al. (2002) emphasise that there is insufficient literature on online surveys in comparison to other types of surveys. Presently, web-based tools exist which permit the automation of survey creation and emailing them various sampled individuals. Even though a minimum rate of response is the key setback to employing an online assessment approach, the researcher is able to acquire several facilities that enhance the outcome.

### **3.9.2.5 Web Survey**

Survey Bristol is a web-founded tool that provides researchers and businesses with affordable and viable approaches for devising and issuing online surveys in an easy and flexible manner. Several types of queries and prompts are issued, such as matrix and multiple-choice questions, text boxes, rating scales, and drop menus among others. Additionally, the Bristol Online Survey facilitates researchers with control instruments to ascertain response validation, ensuring that answers conform to a stipulated entry format such as number, length, email addresses, and date, among others. In order to maximise the rate of response, the researcher is able to utilise a feature identified as skip logic, which permits the generation of custom paths for various respondents, founded on their responses to various questions, in order to avoid wasting their time.

With the researcher being able to issue the survey to the selected sample, a survey link can be initially issued by use of an email address. Another vital aspect and tool issued by Bristol Online Survey is the limitation of responses per a given IP address. This means that a single computer is only able to issue a single response to an online survey. Upon collecting the data, the results are obtained by uploading the data into a Microsoft Excel software format or a CSV file.

### **3.9.2.6 Questionnaire administration and distribution**

For maximum efficiency, it is important to include key informants. Such key informants should be people who hold reliable information regarding the operation of an institution or organisation, those who are responsible for strategic responsibilities of the organisation, and those willing to disclose their information to the researcher (Tharenou et al. 2007, Rubin and Babbie 2009). In universities, the HR managers are typically the chief decision makers in the HR Departments (Thong 1999). For that reason, since the HR managers are responsible for the overall approval of capital expenses (including technology), as well as being well-placed to provide useful data concerning the performance issues of HR functions, they were the preferred source of data for this study.

Out of the 368 prospective participants, 250 responses were received, which is approximately a 68 per cent response rate, from participants who readily and willingly engaged in the survey.

These responses were downloaded from the Bristol Survey web site into Excel spreadsheets for analysis. The data downloaded into the spreadsheets were prepared and imported into SPSS for analysis. The most common reason provided by most of the individuals who declined participation was the fact that they were either not interested or too engaged in other activities. A concise report of the study was provided to the participants as a motivation for them to respond accordingly. For all the participating universities and HR managers, a link was provided in the sent messages so that the participants could access the online survey, in addition to a cover letter elaborating the purpose of the research.

For the purpose of enhancing the validity of the feedback, several phrases used in the questionnaire were adequately defined. Then the different HR Departments of the participating universities were emailed the sample frame. Two more reminders via email were sent within the next few weeks. These reminders were sent to the managers of the various universities chosen for participation. Because of the intricacy of gathering data and the low rate of response from the participating universities, a last call was made to the participating firms as a way of encouraging them to send back the completed surveys.

The data analysis will be discussed in further detail in the next section, and the analysis of the data will follow in the next chapter.

### **3.9.3 Quantitative Data Analysis**

This section will discuss and demonstrate the process, pattern and method applied to the quantitative data analysis carried out in the second phase. The data analysis was conducted with SPSS, which was used to determine the reliability of the data and also to perform the principal component analysis (PCA) to determine which items in the constructs loaded very well. SPSS was used to do the PCA because it has the flexibility and functionality to perform this analysis adequately. These analyses will be discussed in detail in Chapter 5.

The steps used in the quantitative data analysis were based on a modified approach used by Urbach et al. (2010) and Koronczi et al. (2011) in their studies. Thus, the following steps were used to analyse the quantitative data obtained from the second phase of this study:

1. The first step of the data analysis is the PCA to help with data reduction and to confirm whether the 37 items used actually measure the seven constructs.
2. The second step of the analysis is the determination of the reliability and validity of the data. Determining the reliability and validity of the data ensures the internal consistency of the data and also makes sure that the items used to measure the constructs do so adequately.
3. The multiple regression analysis displays the strength of contribution of the preceding constructs towards increasing the use of HRIS, and the universities' HRIS adoption usage; these were the dependent variables during this study. These tools mark the importance of every construct (independent variable) within the model with the assessment of the match of the information to the general comprehensiveness of the planned HRIS model (Pallant 2013).
4. In addition to the regression analysis, a correlation analysis is conducted. Correlation is used when one would like to understand the relationship between two variables, specifically to describe the strengths and the direction of the relationship between the variables (Pallant 2013). A non-parametric correlation was calculated from the Kendall Tau-b test between observed ranked variables and research variables.
5. The data set for analysis was downloaded from the Bristol Survey online database into an Excel spreadsheet, coded and then imported into SPSS for the reliability analysis.

### ***Data Analysis for Survey***

The information was collected by the survey questionnaire and IBM Statistics SPSS version 21 was used to analyse the quantitative data. IBM Statistics SPSS version 21 is regarded as a very important and effective software package for information analysis and screening of information. Principal component analysis and regression analysis, as a part of descriptive statistics, have been used to determine the significance of the impact of HRIS model constructs in reference to one another.

The Kolmogorov-Smirnov test was applied for verification of the normality of the distribution of findings, and Cronbach's Alpha was used to report the dependability of the measurement scales. Additionally, the analysis of staple's characteristics was carried out using descriptive statistics (e.g. principal component analysis). This is a very

important tool for analysing the exploratory data set (Treiman, Thomson and Emery 2014).

The current study involves the impact of independent variables such as system quality, data quality, service quality, and subjective norm on the employment of HRIS, user satisfaction, and HRIS adoption usage for the HR Departments at the five public universities. The relationships between these variables, in terms of influencing the employment of HRIS, were investigated using regression analysis. The first step of the analysis is discussed in the next section.

### **3.10 Principal Component Analysis**

A PCA was carried out as a way of data reduction without sacrificing the accuracy of the data. PCA is a tool developed in 1901 by Karl Pearson to construct a manageable number of components. It avoids using too many variables, which can affect the accuracy of the analysis. In this study, the dependent variable is the organisational variable with five items; and the intermediate variables were “use” and “user satisfaction”. The intermediate variable “use” has seven items, while “user satisfaction” has four variables. The other independent variables measured were system quality, with five items; information quality, with six items; service quality, with four items; and subjective norm, with four items.

PCA is carried out for several reasons. The independent variable is highly correlated, which may affect the accuracy and reliability of data; therefore, it is appropriate to carry out PCA to help to reduce the variables to a manageable level. Secondly, PCA is used to determine how efficiently the number of items can measure the construct system.

#### **3.10.1 Reliability and Validity**

Validity and reliability are two fundamental elements in the measurement of the instrument. The reliability of the instruments used in the quantitative phase of the study was determined using Cronbach’s alpha. Cronbach’s alpha is used to measure the internal consistency, which is the extent to which the items in a construct are consistent (Tavakol and Dennick 2011). Validity is the extent to which an instrument measures what it is intended to measure (Tavakol and Dennick, 2011). The next section will discuss how the reliability of this study was measured.

**The reliable measurement** is concerned with the ability of an instrument to measure internal consistency in a data set (Tavakol and Dennick, 2011). Thus, reliability measures the extent to which the variables (in this case, system quality, information quality, service quality, subjective norm, use, user satisfaction and organisational benefit) are measured consistently. The most widely used method of measuring reliability of data collected with a Likert scale is Cronbach's alpha. It was used to measure the reliability of the items in the constructs in this study, and the results show that all the constructs had a Cronbach's alpha value of more than 0.7, as shown in the results chapter. Cronbach's alpha helps to describe the extent to which all items in a scale measure the same concept or construct. In addition, the reliability estimate shows the amount of measurement error in a test. Cronbach's alpha was developed by Lee Cronbach in 1951 to provide a measure of the internal consistency of an item or scale. It is expressed as a value between 0 and 1. The acceptable values of Cronbach's alpha of an item should range from 0.70 to 0.95 (Nunnally and Bernstein 1994, Bland and Altman 1997). Researchers who have used Cronbach's alpha to measure reliability in their studies include Gorla, Somers and Wong (2010) and Trivellas and Santouridis (2013). Trivellas and Santouridis (2013) used Cronbach's alpha to test the internal reliability of the scales they used to investigate the impact of different MIS effectiveness dimensions on task productivity. The Cronbach's alpha was 0.837, which is well above the recommended value suggested by Nunnally and Bernstein (1994). Gorla, Somers and Wong (2010) used Cronbach's alpha to test the internal consistency of four constructs in their studies.

This leads to the next section, which discusses the validity of the instruments used in this study.

**Validity** is an essential element of any research, as it reveals the correctness, reliability and consistency of the work product that has been produced (Anon 1986). Therefore, validity can be said to be the extent to which the research reflects the reality of the area that is being studied. In the case of this project, this is the extent to which the HRM systems are implemented and evaluated within an educational environment. It is therefore important to understand how qualitative and quantitative research is affected by validity. Validity comes in three main forms: content, criterion and construct. Content validity refers to whether the questions presented are a well-balanced sample of the research area, i.e. the content that is being asked. Criterion validity refers to the

construct score and the criterion itself, while the construct validity is concerned with the instruments themselves and how they should be used, for example how the questionnaire should be distributed (Carmines and Zeller 1979). In this study, content validity is being used as it will look at the content of the questionnaires and focus on using established literature in order to conduct the questionnaires. The reason why established literature should be used is that it provides a more grounded list of questions and issues that should be looked into. In addition, if the literature that is being used contains a questionnaire itself, it can be modified and used within the study being conducted (Cronbach and Beehl 1955).

- In an article published by Onwuebguzie (2003), 50 various issues, which may affect both internal and external validity, were highlighted. These include population validity and researcher bias, these two being the main ones that may apply in this study. These may affect the validity of this study, as both the researcher and the population that has been chosen for this study may have bias towards a certain outcome. In the worst case, the population may not share the view of many researchers and other secondary research which the researcher may have already conducted. Although the latter is unlikely, it is certainly a threat that may affect the overall validity within any research context. Within the quantitative research environment, there are many other factors that may have an overall effect on the validity, ranging from very minute validity issues to much larger ones, which could render the research completely invalid.
- Within a qualitative research environment, however, more attention is paid to the researcher as he is the one who will be carrying out the majority of the research and analysis (Johnson and Onwuebguzie, 2006). At this point, researcher bias plays a much larger part as the researcher may, in some instances, wish for a certain outcome depending upon where his interests lie. This being the case, the validity of the research may be called into question.
- The validity of the instruments used in this study was tested based on the approach used by Urbach, Smolnik and Reimpp (2010). They used convergent validity and discriminant validity coefficients to measure the validity of their constructs. Validity is the degree to which an instrument or scale measures what it intends to measure (Crocker and Algina 1986). According to Straub et al. (2004), the components of construct validity are convergent and discriminant

validities. Hence, this study measured the validity of the constructs by using convergent validity and discriminant validity coefficients. Convergent validity was determined through factor analysis (using SPSS software). Factor analysis helps to confirm whether the constructs measure exactly what they intend to measure. Measurement of data adequacy was one of the methods used to determine the validity of the data before the actual analysis was carried out.

- Despite the many issues that may exist within validity and the potential threats to validity which the researcher may face, there are certain mitigation factors that may be taken into account in order to ensure that the researcher is conducting the research in as proper manner as is possible. The first of these factors will depend upon the researcher taking a very open approach, as many of the threats originate from the researcher himself. Furthermore, the research must also take into account the fact that ethics will play a big part in the validity, for example providing results from multiple candidates who have not been made to feel pressured or biased towards a certain outcome.
- From a more quantitative point of view, the researcher has chosen to adopt a valid approach to ensure that the questionnaires that are being used are seen as an accepted and understood practice. These have been used within the second phase of the study in order to ensure that a validated instrument is used for the analysis (DeLone and McLean 2003).

### **3.11 Research Ethics**

Attention to ethical issues in qualitative and quantitative research design is increasingly seen as important, not just as a routine exercise (Cannella and Lincoln 2011, Miller et al. 2012). Since this study is an interactive one in which human and material resources are involved, the ethical approval process of Coventry University was followed accordingly. According to DiCicco-Bloom and Crabtree (2006), four ethical issues must be considered during any research process. Therefore, to pay attention to ethical issues, these four ethical issues were taken into consideration during the interview process:

- Reducing the risk of unanticipated harm
- Protecting the interviewee's information
- Effectively informing interviewees about the nature of the study



- Reducing the risk of exploitation

For this research to result in benefit to both the researcher and the participants, and to minimise the risk of harm, an ethical approval process was initiated so that this study was conducted ethically. Coventry University's ethical review processes are intended to ensure that all research carried out by students and staff is ethically conducted and remains sensitive to the needs of researchers. All students and staff conducting research with human participants or non-human participants, either directly or indirectly, must obtain ethical approval. Research must not start until ethical approval has been obtained.

Before this study was initiated, the researcher applied for ethical approval online. The process involves answering a series of ethical questions based on the study. Evidence of documents on consent, information sheets, copies of the interview questions, questionnaires, and health and safety forms were completed and attached to the online application form. After two weeks, a response was received suggesting amendments to the consent forms and part of the information sheet. These were made and the application was resubmitted. It was accepted after two weeks. The ethics process involves informing participants about the study.

Participants were informed about the aim of the study and their right to opt out at any stage of the study. They were also assured about the security and confidentiality of the information collected. They were asked to sign a consent form to confirm that they understood that their participation was voluntary and that all information provided would be treated as confidential. They were also informed that they had the right to withdraw at any stage of the study without giving any reason. The information sheet explained the rationale for the study and also assured participants of their confidentiality and privacy. Copies of the information sheet and consent forms are located in Appendices A and B, respectively.

Besides adhering to the normal processes and procedures of ethical behaviour as it relates to research, this research has also conformed with the processes, procedures and regulations related to the risk of confidentiality and other data protection guides and procedures. These steps enable the university to ensure that the research is undertaken responsibly to protect the data of Coventry University.

### **3.12 Summary**

This study explored HRIS adoption and uses in Saudi public universities by employing both qualitative and quantitative techniques, which enabled the researcher to acquire substantial rich and reliable data. The pragmatic paradigm involving inductive and deductive research philosophies was selected for this research based on the research problem, aims and objectives of this study. The choice of inductive and deductive approaches dictated that the researcher choose the mixed-method approach involving both qualitative and quantitative research methods. The justification for the mixed-method approach is given in this chapter. In order to collect the qualitative and quantitative data, this study was divided into two phases. In the first phase, the researcher collected the qualitative data through the use of semi-structured interviews from the sample population comprising of ten participants selected from five public universities. The sample population was strategically and purposively selected with the aim that each of the universities would be represented with two participants for the semi-structured interviews in the qualitative method.

In the second stage of the study, a survey questionnaire was employed and distributed via an online survey method to 368 target participants at five public universities in order to support the results obtained from the initial qualitative research. All the data were integrated and harnessed into one piece of research data. In the data analysis, the purpose of the PCA technique was to produce a reduced number of linear combinations from original variables while a multiple regression analysis tool was used to determine the contribution of independent variables (constructs of the model) towards the dependent variables of model (the use and adoption of HRIS in universities'). Strategies to verify the validity and reliability were carefully justified, and the research ethics and procedures of investigation for Coventry University in a case study environment were adhered to and adopted judiciously.

## **CHAPTER 4: PHASE I**

### **4.0 Data Findings and Interpretations (Phase I)**

#### **Introduction**

This chapter presents the findings of the first phase of data collection, which aimed to investigate and examine the current levels of use and adoption of HRIS among HR Departments at the public universities in Saudi Arabia, and to select the most appropriate dimensions that will be measured in the second phase. The methodology used for the investigation is presented in Chapter 3. Ten HR professionals and managers were interviewed from various HR Departments. The rationale for conducting the interviews with HR professionals and managers was to obtain an in-depth knowledge of their experiences on the levels of use of HRIS among various departments at Saudi Arabia's public universities.

Furthermore, this chapter analyses the data using thematic analysis which involves various phases to actualise the purpose of these research aims and objectives. The discussion on the thematic analysis of the qualitative data, themes and codes developed from the interview data can be found in research methodology section (3.2 and 3.3). The key findings obtained from the qualitative data are presented below.

#### **4.1 Findings of Phase I**

##### **4.1.1 Usefulness**

The participants were asked why they adopted HRIS in their institutions. Two-thirds of the respondents indicated that the reason HRIS was adopted was because of the perceived usefulness of the system. Perceived usefulness is considered as the degree to which an individual believes that using HRIS would enhance his or her performance in an organisation (Davis 1989). Moreover, the demand for useful measures for assessing the overall benefits of HRIS investments has long been acknowledged (DeLone and McLean 1992, Myers et al. 1997). Participants' motivations for using HRIS included the following: the ability to obtain reports quickly, it performs HR functions efficiently, and it controls costs and saves time. Perceived usefulness also included the ability of the system to store large amounts of data and to assist in the recruitment and training of staff (Table 4.2). One of the respondents described the perceived usefulness of HRIS:

*Yes, this is a good question... I think there are a lot of reasons why the university adopted HRIS and these include... the system will help us save time and cost, also this will help us to take decisions quickly... as well as the high ability of saving time and archiving information (P3).*

P8, P6 and P10 listed timeliness as one of the advantages of using the HRIS. Additionally, they expressed that timeliness was considered a crucial factor in two completely different ways: accessing the information that the HR employees required on time, and helping them to do their work in a shorter time. Each of those helped them to fulfil the needs and requirements of their job.

*As a HR manager, working with the HRIS affects my work positively. As an example, it improves efficiency, and reduces process time. In all domains it saves me several hours in my work (P10).*

This is consistent with the work of Troshani, Jerram and Hill (2010), who showed that HRIS is adopted because of the perceived benefits that will be derived, such as time and cost saving and the ability of the system to store large amounts of data. This could suggest that all the universities involved in the first phase of this study realised the usefulness of HRIS adoption. However, further investigation will be needed to support this assertion.

#### **4.1.2 Speeds up Decision Making**

One of the objectives of this study was to discern the factors that affect HRIS adoption and usage in Saudi universities. Respondents revealed that one of the factors that prompted HRIS usage and implementation is the speed with which the system helps in decision making regarding the employees' recruitment, training needs, assessment of skills, and strategic planning and welfare needs of the employees. One respondent commented on HRIS implications for the recruitment of employees in the universities of the KSA:

*With the application of HRIS, the selection process of the employees is made easier, fairer, transparent and simple. It allows us to assess the applicants quickly using the online database of HRIS, and the hiring process can be speeded up, which saves a lot of money and time for the university administration (P5).*

Other participants (P6, P8 and P9) seemed to agree with the foregoing comments:

*The Human resource IS practically helps us to design the software and programs tailored to our recruitment needs. The posts advertised by the university invite applicants from internal and external candidates. The internal candidates' databases are already managed properly; however, the external candidates' databases for each applicant are saved individually by the system. The screening of the candidates according to the given criteria of the job is quickened through matching applications of HRIS during recruitment and short-listing phases. This saves a lot of effort and energy spent by HR managers during the hiring phase (P8).*

The comments clearly demonstrate that HRIS is considered a helpful tool in the recruitment process. It speeds up the hiring process and makes it more efficient and transparent than the manual hiring process, which required a lot of effort in managing the paper work and had a high probability of errors.

Two-third of the respondents claimed that HRIS adoption helped speed up decision making for their superiors. Thus, this showed that since HRIS has been adopted, the speed at which decisions are made has increased, and this has helped HR employees extensively, as stated by one of the participants. This is consistent with the study of DeLone and McLean (1992), who reported that HRIS adoption has given users a better understanding of the decision-making context, improved the decision-making process and hence increased productivity. Also, it has changed the decision maker's perception of the importance or usefulness of the IS. In response to a question about factors that enhanced HRIS implementation in their institution, one respondent (P10) said the following:

*Well, user satisfaction and quick decision making of the system are some of the reasons why HRIS were adopted and implemented. It does also help decision makers to make decisions quickly... Easiness of using the system will lead to speed in decision making, usefulness, flexibility of using the system, the ability of linking the university's different sections that is finance and management (P10).*

These comments show the relevance of satisfaction and the decision-making process, which are a very important aspect of HRIS. In addition, HRIS can improve the decision-making process if the flexibility and ease of use factors are improved upon. Another respondent supported the above views:

*The flexibility of HRIS and ease of use of HRIS within HR Departments can improve the decision, but often this is ignored and bosses wants us to work on HRIS which is not flexible; this does not produce much productivity for the company even if we work for longer hours (P5).*

This is an indication that either the type of HRIS used is very important because some have better features than others, such as some HRIS is user-friendly in design, easy to understand, or more flexible, or this shows that working longer hours and pressures from management cannot improve the productivity of HRIS in terms of speeding up the decision unless the elements of flexibility within HRIS tools have been ensured. Therefore, there is a need to ascertain what HRIS tool is suitable for the HR Department.

#### **4.1.3 System Quality and Ease of Use**

One of the most studied measurements of IS success is system quality, which is considered to be an important factor in measuring the capability of the organisation to gather and process information efficiently (DeLone and McLean 1992). In other words, it shows how hardware and software can be integrated and work together as one system to achieve the organisational objective of saving time and resources for information gathering and processing. System quality has been operationalised in so many ways in IS platforms, the most relevant being the convenience of access, flexibility of the system, integration (Bailey and Swamson 1974) and reported use (Maish 1979, Fuerst and Cheney 1982, Raymond 1985). Another measured fact is that it is difficult to separate effectiveness from efficiency when considering how an IS is used in day-to-day activities in organisations (Delone 1992). The ease of use is complemented by characteristics that help expand system quality, which include effectiveness, error tolerance, efficiency, ease in application and enhanced engagement in practices for company controllers (Raymond 1985). DeLone and McLean(2003)emphasised that the ease of use of HRIS has also been studied at different levels of adoption. For example,

Vanlommel and DeBrabander (1975) discuss four levels of use: getting instructions, recording data, gaining control and planning.

This study presented HR professionals' views on HRIS quality and ease of use. Responses from participants showed mixed and inconsistent views on system quality and ease of use. For instance, one participant (P3) revealed:

*The system quality and ease of use prompted the institution to adopt HRIS (P3).*

Another participant (P5) expressed comments which were quite opposite to those of P3:

*Because they have no involvement in the design of the system, they often face difficulty in the use of various features of HRIS applications. This indicates there is need to build a user-centric HRIS system (P5).*

In addition, participants P7, P9 and P10 revealed that the quality of the systems they used should have the ability to archive large amounts of data and employee information at the same time. In addition, they showed that the system should be flexible and easy to use:

*HRIS in the HR Departments sometimes does not process the data quickly whenever I seek to access the information about particular employees; I become fed up and feel like leaving the office. The university management needs to improve the easiness and flexibility of the HRIS for quick processing of the employees associated data (P2).*

Furthermore, the presentation, format and content of the HRIS contribute to increasing the ease of use of the HRIS system. One of the participants reported that the ease of the system could be improved in this way:

*The most vital benefit of the HRIS is that it's a simple system to learn. Easy to link with totally different departments, easy to visualise and correct the work, and easy to induce a report. Overall, it changes the approach we used to work for the better (P3).*

This supports the work of DeLone and McLean (2003), who suggested that system quality should have the ability to measure ease of use and be flexible, portable and reliable. Thus, the quality of the HRIS must engender user satisfaction. Due to the

mixed results of the HRIS system quality and ease of use of, it is suggested that further study should be conducted in these areas in Saudia Arabia's public universities.

#### **4.1.4 Lack of Training Programmes**

An interesting finding in this study was that participants reported that their respective universities do not pay any attention to the training needs of employees. Three out of the five universities top HR managers, such as the Northern Borders University, emphasised that most of the employees in KSA universities are old people and experienced in working and dealing with paper-based information. They were aware of the training requirements for improving their understanding of the systems. The participants of this study reported that training is essential for them, and without it, they cannot execute their routine work relating to information handling through their HRIS. Participants P2 and P5 agreed that more training is needed for HRIS users in the university HR Departments:

*I think that it is vital to do continuous investments to provide effective training through the skills- and needs-based training programmes to equip the employees with the updated knowledge and skills relating to the new HRIS functions added to the HRIS portfolio (P 2).*

Participants P6, P9 and P10 believed that most of the HR staff in the universities experience difficulties in terms of resolving inconsistencies during information requests about data relating to a particular employee's history. Participant P5 is of the view that these inconsistencies appear due to pressing the wrong key or changing the system's default settings to access particular information. This shows that despite the changes in HR Departments that was due to the introduction of HRIS, the factor of continuous training is often ignored. Training is essential because this enables employees to execute the HRIS functions effectively and to maximise the full advantages of the system. Furthermore, comprehensive training programme designs are needed to fulfil the development of HRIS-related skills. Also, an important task is how the organisations will motivate and encourage their employees on the benefits of the HRIS system. This was one of the comments presented by one of the participants:

*I emphasise that design of training programs must be tailored to include the features of the system and processes relating to execution of*



*information search and matching options, so as to avoid any unnecessary delays, and this will also help reduce mistakes and make the users comfortable (P9).*

Some other participants (P2 and P6) stressed upon the need of increasing the awareness level of employees about the use of HRIS through the introduction of training courses and awareness programmes.

*There is a distinction between a full, sturdy training course and a short session. I believe what was provided for them was a session more than an appropriate coaching course. The staff desire intensive courses to create confidence in them ( P6).*

Another participant (P9) agreed with the views of P6 and recommended that longer training courses were better than short courses, particularly for those with very little or no knowledge of HRIS:

*A strong programme of training is actually necessary to provide our employees with knowledge, strength and confidence in terms of using the HRIS (P9).*

Employees appeared to be aware of how vital training was, since it might facilitate them in enhancing their work and increasing their productivity. Therefore, there was a requirement for adequate training courses before, during, and after implementation. Early training would facilitate the staff to just accept the new system (HRIS) and reduce any discontent or resistance that they may feel towards it.

However, the training programme was not adequate to their desires. Consistent with the views of P7, a continuous or long-term coaching course is essential to increase their productivity and enhance their performance:

*The coaching the university has provided is sweet, however it is not enough. As users we are craving for a continuous programme. It is better to be up-to-date and more familiar with the HRIS (P7).*

Continuous training is also essential to enable workers to familiarise themselves with the new system (HRIS) in general, as well as to each specific job in particular.

Moreover, employees required a comprehensive coaching programme to facilitate their development of IS skills.

*Training would be more helpful if it created both the HRIS's features and related work processes. This may facilitate employees to be comfortable and minimise mistakes (P9).*

#### **4.1.5 Updated Versions and Customised HRIS**

Another important result of this study was that the HRIS system being used by the HR Departments at universities in the KSA is old and un-customised. HRIS should be custom tailored for each organisation to gain the maximum benefits out of it. HRIS infrastructure requires specific packages and software updates to keep them up-to-date with user requirements (Kavanagh and Thite 2009). However, this study found that HRIS packages used by HR employees of the participating universities were derived from the HRIS packages originally designed and used by private enterprises in Saudi Arabia. The feature requirements of the private business-oriented companies are different in comparison to those for service-oriented educational organisations. The differences in the HRIS features and requirements could possibly impact the validity and effectiveness of the system. Participant P8 highlighted this fact during the interview in this way:

*The universities in the KSA are reluctant to invest in the design of HRIS customised to the data processing requirements of the universities. They have borrowed the HRIS system designed for the profit-based organisations. This causes a lot of difficulties in producing accurate and effective information processing (P8).*

Another participant (P7) recorded his opinion about the quality of the system:

*I cannot find the specific information relating to employees of the university. The system always shows the general information about employees but does not show the specific information as requested (P8).*

Participants: P1, P2, P5 and P6 expressed the same opinions on their systems' status. They were of the view that their system is quite old, features are not updated regularly, and employees' data is not updated on a periodic basis. This causes a major challenge

for them to find the data relating to them in the HRIS. Periodic updates are necessary for HR employees to track the changes in the information pertaining to new employees, their leaves, leave salaries and performance-based bonuses. This clearly indicates that the systems are old and do not undergo regular updates to enable HR employees to gather and process information:

*I tried to find the information relating to the health and leave data about some of the academic data, and when I entered his name in the HRIS system, just his name and position appeared without the attachment of the requested data files (P5).*

This shows that HR managers are unable to keep the employee information on the system up-to-date.

According to P5, the university designed its HRIS to its needs by choosing appropriate components and by setting parameters that allowed the university to modify the system within the boundaries set by the developers of the application. HRIS was designed in-house by a local firm. The university management decided on a local company instead of a global one for several reasons, including cost effectiveness, ease of contact, and also the ability to deal with any changes or configurations based on the university's needs:

*Choosing a local company can never be a bad decision. In fact there's no comparison between a local and a global one. However, with the native one, we are able to ask for any modification or changes we need on the HRIS, if the company understands the needs of the local universities (P5).*

Another participant (P8) showed agreement with views of P5 in this way:

*Customisation wasn't a heavy issue in our department since the HRIS is provided by a neighbourhood company which makes it easier and versatile for the university to customise and modify any function to suit its needs (P8).*

Participants P4 and P3 seem to agree with above views by commenting that customisation of the HRIS to satisfy the university's need was not a barrier for them.

This was attributable to the company's flexibility and its direct reference to the university, eliminating the need for a mediator company.

P2 asserted that like any organisation, they required HRIS packaged software that was possible to assemble or modify to fulfil the HR Department's desires. There is a misunderstanding between the university and also the system supplier, inflicting a delay in the implementation of it:

*Unfortunately, the supplier failed to respect its contract with the university, so the university had to debate all items in the agreement once more. At the end, the misunderstandings were resolved and the process continued (P2).*

Therefore, there is a need to have an agreement between the universities and the HRIS vendors based on requirement issues, functional issues, and what the universities policies are all about.

#### **4.1.6 System Flexibility**

HR managers participating in this study were of the view that inflexible or insufficiently flexible systems can hamper their progress and HRIS performance by making it difficult to handle exceptional circumstances. Consequently, for the effectiveness and success of the HRIS, it needs to be adequately flexible. Participants P1, P2, P3 and P8 reported some differences and discrepancies in the flexibility of the systems being used by universities in the KSA. All the participants agreed that the degree of flexibility is a critical function of the HRIS infrastructure and that it is important to have the ability to introduce modifications to the system features or pre-built functions to make them suitable for specific jobs. The participants in this study believed that HRIS flexibility is an important aspect of daily activities, such as modification of data, transferral of data from one department to another, and dealing with variations over time. Furthermore, participants P2 and P3 asserted that flexibility of HRIS enabled them to execute their routine tasks efficiently and effectively.

*The HRIS system provided me with ability to process the conventional and unconventional changes and improved their performance (P3).*

However, P5, P6, P7, P8 and P10 reported the opposite experience, suggesting that their systems did not support their tasks:

*The problem of adjusting the salary allocations to permanent and contractual employees could not be solved within the exiting features of the HRIS. We have also not been allowed any option to change the features (P5).*

Interviewees gave differing opinions relating to the flexibility of the HRIS. P5 and P3, described as HRIS-users, were quite happy with its flexibility and depicted it as versatile to use, providing a suitable level of flexibility as well as creating transactions quicker. This degree of flexibility was provided at the time of implementation:

*The level of flexibility in the HRIS is actually obvious; it has improved my ability to respond effectively, ever-changing underlying information, and its result is to alter performance positively (P5).*

In contrast, P9 believed that flexibility could and should be improved by upgrading the HRIS to meet their future needs:

*I agree that HRIS incorporates a high degree of flexibility once using the system daily; however as a HR manager I look to possess a higher degree of flexibility by updating the HRIS in the future to satisfy the development work desires (P9).*

To conclude, P1, P6, and P10 agreed that flexibility was a vital issue and believed that it was having a major impact by increasing their productivity and accuracy on every job.

#### **4.1.7 Subjective Norm**

One of the questions asked to respondents was “what lessons have you learnt since the adoption of HRIS within their institution?” Most of the views expressed by the participants were mixed; some of participants reported that there were social and competitive pressures on their institution to adopt HRIS, because if they did not do so, they would lag behind their competitors in the educational sector of the KSA. The motivation for HRIS adoption comes from an ever-advancing education system and the management of employees at the organisational level. Furthermore, participants also

reported that due to competitive and managerial pressures, they adopted HRIS to increase their profile in the educational environment in particular, and in the public generally. One respondent summed it up by saying:

*Not only did we adopt HRIS to help us manage our human resources and administrative activities, but also so that other universities and public organisations would approve of our operation as we use HRIS (P1).*

This, therefore, suggests that, apart from reasons such as system quality, ease of use and high speed in decision making for HRIS adoption, there is also a perceived pressure from the public and other institutions. This perceived pressure or opinion relating to what others think about what one should do or how one should behave is termed as *subjective norm*. The important finding of this research work is that pressures from colleagues and peers are considered as the main obstacle to the successful adoption of HRIS. The working environment of HR Departments within the universities in the KSA comprises old, inexperienced HRIS users, with most of them having mastered handling paper-based information and processing in the written form rather than depending on computers. During the interviews, it was found that participants did not motivate each other to use HRIS. One of the participants (P5) encountered an issue in handling HRIS information and consulted a nearby colleague to assist him in handling the issue; the colleague discouraged him from using HRIS:

*Why are you using this complex system? Use papers and stock registers for referencing and noting some information instead of these complex applications. You are wasting your time (P5).*

This kind of working environment is often a big obstacle in executing the HRIS system successfully. Without proper training and removal of a conservative approach, the universities cannot successfully implement the HRIS system. However, the pressures from senior management and the leadership of the organisation force them to use HRIS. Therefore, the attitude of leadership towards the constant usage of HRIS for information handling is a positive attitude, which can ensure the successful adoption of HRIS.

*My boss always puts emphasis on using the HRIS for handling information in terms of data storage and processing in every monthly meeting; that is why I try to use it – to please my boss (P10).*

These results indicate that, though the pressures from organisational leaders can make employees use HRIS, colleagues and same ranked employees are not supportive of each other. These two opposite working behaviours can affect successful HRIS adoption.

#### **4.1.8 User Satisfaction**

A further interesting finding from the interviews was HR professionals' level of satisfaction with HRIS use. There were mixed responses to the questions about user satisfaction. Three HR managers who participated in this study reported that the system is really good and gives them the ability to manipulate a lot of data in a short space of time compared to the manual work of data entry in stock and employee registers. For instance, one of the participants (P 6) recorded his opinions:

*I found the system efficient in terms of handling the data. Amazingly, I found the time reduced considerably. I am really satisfied with the accuracy of the results (P6).*

A HR manager from Shaqra University agreed with participant P6 and commented in this way:

*Our university has installed the HRIS, which is very quick and efficient as was expected. The company, which installs this system regularly, does the maintenance service and removes bugs from the system regularly. This has solved many problems that we used to face in entering the data manually (P5).*

A HR manager from Qassim University expressed similar views. This indicated that system quality is good in these universities, and managers and directors of HR Departments are satisfied with the results obtained from the systems. However, the views obtained from the HR managers from Northern Border, Al-Jouf and Hail Universities were opposite to those obtained from Shaqra and Qassim University. They reported that the system in their HR Departments did not meet their expectations of

efficiency, accuracy and a quick data handling process. Participants P5 and P8 from Northern Border University had some reservations about the system, which made them unsatisfied with the use of it:

*The system is old enough, which does not provide me all features; sometimes I face problems in processing exceptional data obtained from employees. For example, sometimes the health-related data of university employees has unusual variations due to some conflict with the hospital-acquired data, which is normally requested by the university about every employee (P8).*

*The system does not allow me to process and synchronise the data from various sources. I often feel it is easier to process such data by entering them into the data entry register (P5).*

Another participant reported:

*The system is old and I am not conformable with working with the HRIS as it has un-customised features. Most of the time, my colleagues and I prefer to use paper for data entry rather than using the HRIS system; this takes less time compared with the HRIS system (P7).*

The Dean of Employee Affairs from Al-Jouf University said that it does not facilitate the users, due to many issues reported by HR employees about having inaccurate data. This may delay the achievement of important outcomes from the data, which are considered to be important for making timely and well-balanced decisions within the organisation. Similarly, a HR Manager from Hail University expressed his opinion on the satisfaction of users:

*In my view, the system is inadequate and inefficient because it is slow and inappropriate for our daily routine work (P9).*

HR managers (P5, P6 and P9) from Northern Border, Al-Jouf and Hail Universities recorded similar opinions about the HRIS user satisfaction dimension, which was indicative of the fact that overall, the systems are not capable enough to fulfil the users' satisfaction in terms of saving time, easy data handling and decision making. As six participants out of ten expressed their dissatisfaction with the use of HRIS applications,



it was concluded that most of the users are not satisfied with the design and features of the systems. Primarily, this results from various contributory factors, such as inefficiency, the lack of precision and accuracy, and the update status of the HRIS infrastructure. The non-alignment of the HRIS with the users' demands and expectations in the participating universities is found to be a major factor causing the dissatisfaction of users with HRIS use.

#### **4.1.9 Need for Unification of the System**

The need for unification of the HRIS platforms was found to be an interesting finding of this research. The interviewees expressed their concerns about the fragmented nature of the HRIS in all of the universities. They reported that each university uses a different HRIS, which makes communication and unification of the systems difficult. All the respondents suggested that the HRIS system should be unified to provide a seamless system for the whole country.

*There is a crucial need for unification of HRIS for all universities to ensure effective sharing of information and ease of flow of data for strategic planning in all Saudi Arabian universities (P1).*

This finding would contribute towards the systems' ease of use, especially when employees are transferred from one public university to another. Different HRIS platforms are encountered, which means that skills and training related to the systems' use are different depending on the particular university. Participants P7 and P10 reported that they were transferred from one university to another school, and they struggled to learn the new HRIS features and different applications at their new universities.

*It was not easy to use the HRIS when I had been transferred to some other university. I faced difficulties in grasping the working principle and modes of the new applications. The HR Departments arranged separate sessions to train me, but they were not very helpful (P7).*

This also indicates that HR Departments invest a lot of funds to train new HR employees being transferred from another public university due to the lack of HRIS systems unification across the spectrum of public universities in the KSA. However, this training does not necessarily fit the needs of individual employees.

#### 4.1.10 Service Quality

Most of the participants in the study agreed that the lack of good quality of service and the problems in service delivery affected the performance and productivity of HR employees. In terms of responsiveness and assurance, the HR professionals taking part in the study reported that delays in the delivery of services were often observed due to a lack of technical maintenance of the HRIS systems. Consequently, this resulted in poor quality services, which in turn affected their performance and productivity.

*A lack of good quality service from the maintenance and technical experts affected the productivity of our work severely. This caused some delays and disruptions in the delivery of services to the client (P4).*

The majority of interviewees agreed that a lack of good service quality affect their productivity and performance. This may be explained by the lack of excellent service and technical support for HRIS users in their work that was seen to have affected their productivity and performance:

*The absence of good service quality from the supplier is negatively affecting our productivity. This poor service causes delays and cripples the work (P8 and 10).*

Advanced support from the services provider would be required to facilitate the work of HRM staff, to resolve any problems that they might have, and to avoid any delay or postponement of stakeholders' tasks.

All of the participants believed that service quality factors (reliability, responsiveness and assurance) had a significant impact on their performance. They believed that quick responsiveness from the services provider to answer stakeholders' queries, build a case for facilities, and solve problems was extremely important for them:

*We are probing for fast responsiveness. It's vital to feel secure and safe in my work in case something happened to the system. We need to be able to search for support and help as quickly as we need it (P6, P8 and P3).*

This shows that involvement of the service providers and the system's maintenance team are considered to be essential for improving the system's quality.

#### 4.1.11 Hindrances to HRIS Adoption

One research objective was to determine the factors that hinder HRIS adoption in Saudi universities. It was observed that there were many reasons that prevented HRIS adoption, including poor system quality, inaccurate information generated by the systems, difficulty in use, the high cost of maintenance, inadequate design, a lack of familiarity with the systems, inappropriate systems, and systems that are old and slow.

IS/HRIS implementations usually fail because of study resistance from users. This problem should be addressed, particularly in the case of the public sector. Participants P3 and P9 stated that although the workers are aware that the HRIS can help them with their performance in several ways, older users who had spent most of their careers working with the old systems, prefer to work with these systems for the rest of their careers, instead of spend time learning how to work in the new HRIS, that they perceive to be complicated and hard to use even before they try it. The majority of the universities expressed the issues as a resistance, and it was the major problem that they envisage during the implementation of the HRIS:

*It was really laborious for us to persuade the employees to use the new system (HRIS), especially those staff who'd spent their careers working with the traditional means, and in particular the older users who didn't have many years left until their retirement (P3 and P9).*

Most Saudi universities operate in the public sector, receiving funding and support from the government, hence the majority of personnel are government employees. This explains why the employees thought that their jobs were secure, according to P7:

*Dealing with government employees leads us as managers to another problem, that is job security. The employees thought that using the new system that is HRIS was not obligatory and by law nobody will fire them; thus we have to take different actions to resolve this problem (P7).*

Participant P5 emphasised that, as a manager, in order to resolve these issues, there is a need to put in some sort of scheme that will address it. This was the manager's comment:

*To solve this problem, as managers, we are in agreement to link attending courses and using the new system effectively with promotion for all the*

*employees in the same department. This decision was useful and helpful; by ending this problem we are able to currently turn our efforts into evaluating the benefits and disadvantages of the HRIS (P5).*

P8 and P10 felt that resistance to change may cause several problems for the university in general, and the HR Department in particular, as well as delay or slow start-up and block or hinder implementation, which will cost the university substantial financial expenses. Therefore, sturdy and effective leadership at the management level was essential to support decision makers and to influence users to use the system effectively.

*It is noticeable that employees' resistance to alter, affected the system implementation in the HR Department and caused several problems, such as delaying the implementation (P10).*

These views highlight the importance in the identification of the hindrances and point of resistance within the HR Departments of the universities for the successful implementation of the HRIS system. Furthermore, the success of the HRIS implementation and increased use of HRIS can not be achieved unless the strategies are designed to overcome the pockets of resistance within the concerned departments.

#### **4.1.12 Poor System Quality**

All of the participants in this study reported that the HRIS in their organisations are of poor quality. The Dean of Employee Affairs from Al-Jouf University expressed his thoughts about the poor system quality:

*The quality of data from the HRIS system is often not good. It does not help the data analysers in the HR Department to interpret it quite well and efficiently. This results in the lack of our ability to find the right solution avenues. Sometimes, the users and analyser both find the quality of the information obtained from HRIS suspect (P 3).*

HR managers from Hail and Northern Border Universities agreed with the views of participant P3, and the HR Manager from Hail University further added to the poor system quality:

*Data processed by HRIS is not up to the standards of the good quality being used in our organisations. Such data cannot be easily relied upon*

*until it is supported by expert advice from experienced users in HR. This leads to compromising the overall “business intelligence” of our organisation (P3).*

#### **4.1.13 High Cost of Maintenance**

The high cost of maintenance was another factor found to be hindering the use of the HRIS systems within the universities in Saudi Arabia. The managers from Hail, Al Jouf, Northern Border and Qassim University reported that their HRIS was expensive, as the companies responsible for maintaining the HRIS systems charge large fees on a yearly basis to remove the bugs and to provide technical and professional advice.

*Our university is a newly founded university; we do not have a long history of providing educational services like old universities such as King Saud University. The university does not attract much funding from governmental sources due to a lack of capabilities in many areas. This results in our inability to pay the high maintenance fees to the HRIS maintenance companies. Therefore, the university administration is not able to expand the system usage in many areas of the business (P6).*

Another participant added the following:

*We don't use the HRIS system to gather and process the information for managing the estate functions and data about the customers being targeted in various Gulf countries. The expansion of the system means we need to pay extra fees to maintain each domain of the HRIS (P4).*

This clearly demonstrates that the high cost of maintenance is a major barrier, not only in adoption, but also in the expansion of HRIS usage for many domains of information within Saudi universities.

#### **4.1.14 Lack of Involvement of HR Professionals in the HRIS Design Process**

The lack of involvement of HR professionals in the HRIS design process raises another obstacle in the adoption of HRIS systems within universities. This is a very important factor in considering the various HRIS dimensions, such as ease of use and system quality (Wang and Liao 2008). The participant from Shaqra University recorded his opinions about the factors hindering the adoption of HRIS within his organisation:

*The administration borrowed the design and implementation of HRIS from private enterprises in Saudi Arabia, which are often not customised to our requirements. Our HR employees suffer many issues due to inconsistency of the HRIS system. It straightaway puts off the employees from using HRIS (P7).*

HR managers from Hail, Qassim, Al-Jouf and Northern Border Universities agreed with the views of the HR manager from Shaqra University. This indicated that all the HR managers are of the view that their involvement in designing the system is non-existent, which has led to less HRIS usage within their organisations.

#### **4.1.15 Inappropriate and Difficult to Use:**

The inappropriateness of the systems for several data handling tasks within the university environment is another factor reported to be causing delays in HRIS adoption in Saudi universities. The system is not tailored to regular data handling operations, which makes it complicated for HR employees. This was found to be an important hindering factor in full-scale HRIS adoption. All participants reported similar opinions about the inappropriateness of the systems.

The outcome of qualitative Phase I revealed many factors, such as system quality, information quality, service, user satisfaction and impact on organisational performance, which affected HRIS adoption in Saudi Arabia. Social pressures also affect the adoption (subjective norm). All of the factors concluded from this phase which affected HRIS adoption in universities are the same as those described by the success model proposed by DeLone and McLean (2003), except the influence of social pressure (subjective norm) behind the adoption of HRIS. These findings enabled the researcher to extend the DeLone and McLean model by adding the construct of subjective norm into it, which is the main novelty of this study. The new model developed through this phase will be discussed in detail in Chapter 6. This model needs to be tested and measured quantitatively for HR employees to universalise it for all of the HR Departments in public universities in Saudi Arabia. The next chapter will provide the analysis of quantitative results, which will be called the Phase II analysis from here on.

## **4.2 Comparison of the Participants' Universities**

### **4.2.1 Employees' resistance**

The HR Departments at the five universities agreed to address resistance to successful implementation. This resolution was established to be successful with public sector employees, and that they seriously commit to solve it by many ways, such as training, increasing their knowledge to understanding the full advantages they will gain from applying the HRIS, and how it will improve and facilitate their daily works. Three universities, WBU, SU and AJU, face serious resistance in implementing the new and updated HRIS due to new leadership, less experience in managing the HRIS and inexperienced employees. However, two universities, AQU and HU, showed more awareness to the type of resistance and strategies which can be used to overcome the resistance due to being old in the academic field and having a long track record of using HRIS.

### **4.2.2 Customisation and Unification of the system**

According to participants from SU and AJU and WBU, customisation was among one of the barriers faced by the HR Department at the universities, particularly during attempts to apply the HRIS to the human resource department's needs. HRM's option in implementing HRIS in the local area was a good decision that will facilitate HR functions effectively; the local company offered flexibility and direct guidance to the university, enabling it to just accept or order desired changes. Adopting a local HRIS is less expensive than using the services of renowned international firms.

Although participants from AQU and HU admitted that the HRIS user interfaces are not user-friendly, and that the system wasn't suitable for stakeholders, the customisation of the system was highly advanced and was achieved without any major problem. Consistent with (P.6), upon identification of the software package by the university, the suppliers were contacted to initiate the preparation for implementation.

In contrast, customisation was the serious problem that HU and AQU, WBU faced with its HRIS. In fact, the issue was with the supplier company, which failed to fulfil the agreement it had with the university, inflicting a delay in implementation for a few departments. From this comparison between the universities, it is clear that the system provider plays a crucial role in enabling customisation before implementation; the important factors are clear requirements, contracts and powerful commitments.

Unification of the system was another need reported by respondents from all the universities. However, AQU and HU universities seem in much better position to launch this initiative compared with WBU, SU and AJU, which may struggle to unify the system due to facing some financial issues, since these universities are relatively newly established within the KSA. The support from the government may enhance their capabilities to customise and unify the HRIS, which can ultimately improve the use and adoption of HRIS for the performance of the Saudi public universities.

### **4.2.3 System Quality**

#### **4.2.3.1 Training**

Unsurprisingly, all interviewees from all five universities agreed that well programmed coaching courses were essential to them; actually, this was considered the foremost vital factor. Training empowered participants with additional expertise and confidence in the HRIS that they perceived as more user-friendly. Moreover, they declared that they desired more dedicated and thorough coaching, rather than short sessions of a few days.

#### **4.2.3.2 Flexibility**

Interviewees from all of the universities demanded enhanced and updated flexibility, as a result of what they had currently. Implementation of HRIS across universities will promise flexibility of use. Unfortunately, all of the universities where this study was carried out, are trying to increasing the flexibility of the HRIS through importing and maintaining the HRIS from international clients. All of the participants believed that HRIS flexibility could be improved by hiring local clients, which can understand the needs of universities within the local environment.

#### **4.2.3.3 Timeliness, Ease of Use**

Interviewees from all of the universities had similar opinions concerning the following factors: timeliness, ease of use, enhanced work productivity, and a positive impact on their performance compared with the traditional method.

### **4.2.4 Service Quality**

There is no doubt that service quality affects HRIS use in both positive and negative ways. Interviewees at all five universities agreed that the standard of service provided by the suppliers would play a significant role in their use and productivity for the Saudi public universities.



The participants from AQU and HU indicated that the service quality provided by the suppliers was of a high standard in terms of fast responsiveness and the provision of up-to-date hardware and software systems. In contrast, AJU and WBU did not feel that they had received the service support they should have had.

The provision of adequate service support is extremely important; the absence of skilled service definitely affects HRIS use negatively. For instance, late response might reduce productivity and cause delays in work. Participants reported these views from SU.

### **4.3 Conceptual framework for measuring HRIS success**

One of the objectives of the current study was to propose a conceptual HRIS framework for measuring the success of the adoption and use of HRIS in the context of Saudi public universities. The literature review was conducted to provide a detailed study based on the design and practices of the HRIS framework, but the study shows that there is insufficient knowledge with respect to HRIS adoption and use in Saudi public universities. However, there are several models which either measured the adoption or success of IS in public or private organisations. Nevertheless, there were a limited number of studies that measured the use and adoption of HRIS success for the organisations (see literature review section 2.14). Therefore, based on the recommendations and suggestions from the literature review in developing the new conceptual model, the qualitative method was selected to explore the dimensions of the HRIS proposed by this study (Methodology chapter section 3.4.3). Phase I of this study was a qualitative study, in which 10 HR managers of five public universities in Saudi Arabia were interviewed. Based on the findings of the qualitative phase I, it was found that most of the dimensions (service, quality, system quality, information quality, users' satisfaction, systems' use and adoption) were consistent with the IS model proposed for measuring the success of IS within organisations. However, subjective norm was found to be a novel dimension. Therefore, the HRIS framework was proposed by this study by incorporating the subjective norm dimension into the D&M IS success model. The proposed HRIS framework has been shown in Figure 4.1.

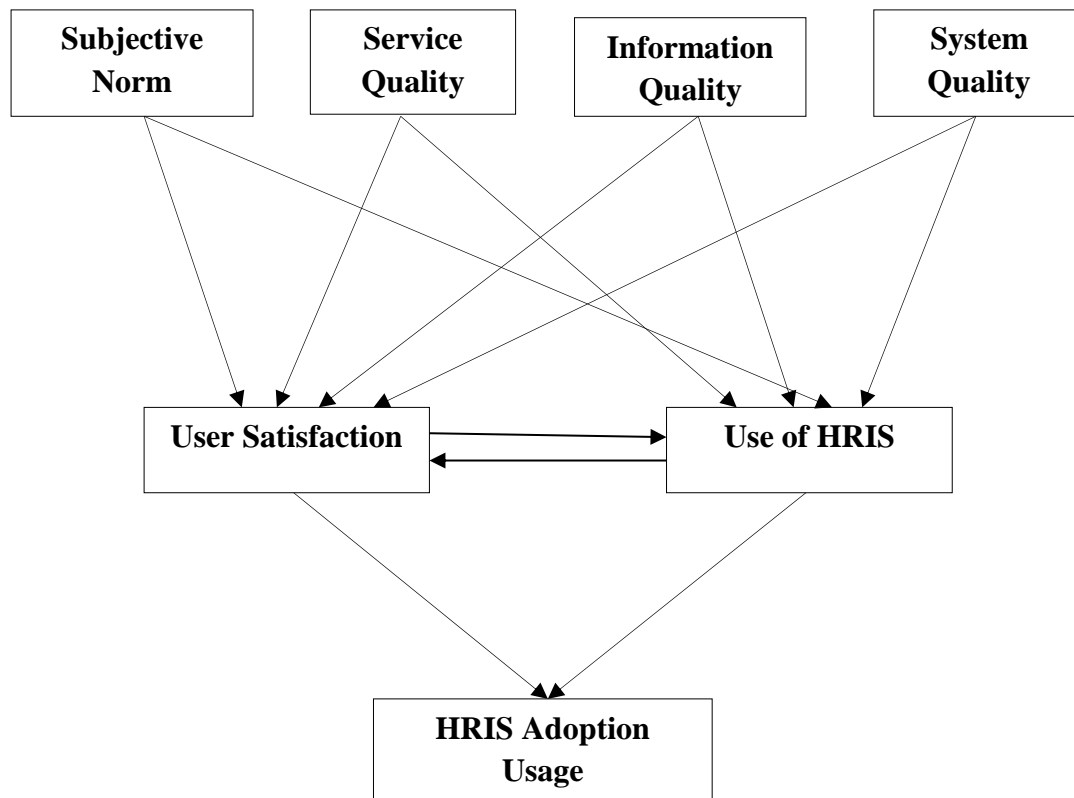


Figure 4.1. This Study's Proposed Research Conceptual Framework

Consequently, the proposed HRIS model has seven constructs: subjective norm, system quality, information quality and service quality (as independent variables), system use and user satisfaction (as dependent variables), and organisational HRIS adoption. Nevertheless, the proposed HRIS framework needs to be validated and implemented in the HR departments of public universities in Saudi Arabia. A total of eleven hypotheses were developed (detailed in the literature review) to determine the impact of various constructs on the organisational HRIS adoption, users' satisfaction and use. This study applied a quantitative method for determining the associations and relationships, and testing the hypotheses (literature review section 2.15). Thus the next phase of the study constituted the quantitative phase II, which implemented the proposed HRIS framework in the HR departments of public universities in Saudi Arabia.

## **Summary**

This chapter has presented the findings of the first phase, i.e. the qualitative phase of the data collection. Semi-structured interviews were held with HR professionals and managers at five public universities in Saudi Arabia: WBU, SU, HU, AJU, and AQU. The experiences and opinions reported by the respondents participating in this phase of the study were informative and motivated the researcher to develop the HRIS success model presented in Chapter 2. This analysis provided the researcher with new insights into the factors, such as the subjective norm, affecting HRIS use in the Saudi context. Therefore, the researcher added this construct to the existing DeLone and McLean success model to build a success model applicable to the HR Departments in the public universities in the KSA. The various constructs of this model will be measured quantitatively and discussed in the next chapter, phase II.

## **CHAPTER 5**

### **5.0 Data Findings and Interpretations: Second Phase**

#### **5.1 Introduction**

The aim of this chapter is to validate the proposed research model and test the hypotheses by using an appropriate statistical approach.

The purpose of the first phase of this study, as mentioned in Chapter Four, is to explore the current level of use of HRIS in the HR Departments in public universities and to select the most appropriate dimensions that will be measured in the second phase. The data collection method selected to achieve this objective was semi-structured interviews and the findings from these have been reported in Chapter Four (Section 4.1.1).

In this section, the findings obtained from the second phase of this study (the quantitative phase) are presented. These findings offer insights into the quantitative relationship between the factors implicated in the HRIS use model developed as a result of findings from the first phase of this study (the qualitative phase). Data analysis encompasses techniques and processes involved in cleaning, transforming and evaluating data to find useful information regarding the research questions. Data analysis can be broadly divided into two processes: qualitative data analysis and quantitative data analysis. In qualitative data analysis, the data is analysed by exploring themes and factors, while quantitative data analysis comprises analytical and statistical techniques.

The findings from phase I make a considerable contribution and feed into the second and main phase of this study. The objectives of phase II are:

- To propose a conceptual HRIS framework for examining the adoption and use of HRIS in the public universities of Saudi Arabia.
- To test empirically the proposed conceptual HRIS framework in the HRM departments of Saudi public Universities.
- To provide organisational recommendations based on the finding of this study for the Saudi public universities.

During this final phase of the study, the data was collected using an online survey method (Bristol survey). This chapter presents the findings of this survey questionnaire, which was completed by over two hundred and fifty respondents. This phase of data

collection investigated each construct, and each of the hypothesised relationships of the conceptual model that were proposed in Chapter Two. The data collected through the survey was analysed using SPSS version 21. Section 5.1.1 reports the structure of the research tool followed by gender in section 5.1.2. Section 5.1.3 discusses the demographic variables, the response rate obtained for the survey, and the characteristics of the sample. This is followed by the structure of the research tool: section 5.1.4 reports the appropriateness of factor analysis and the sampling adequacy for a set of variables, and section 5.1.5 describes the scree plot. Section 5.1.6 presents the estimations of communalities. Principal Component Analysis is set out in section 5.1.7. Section 5.1.8 reports on the reliability analysis, and the correlations test is described in section 5.1.9. The normality testing procedures used in the study are addressed in section 5.1.10. This is followed in Section 5.1.11 by the regression test. Section 5.1.12 presents the linear regression. Finally, the summary is presented in section 5.1.13

### **5.1.1 The Structure of the Research Tool**

This section presents the data analysis conducted in the second phase of this study. The second phase analysed the responses from the questionnaires using SPSS software. The data analysis was conducted in four steps using SPSS. Exploratory factor analysis (EFA) with the PCA method was used to determine instrument validity in the questionnaire. Chronbach's Alpha was used to determine the reliability of data and to perform PCA, which was used to reduce items into factors so that latent variables could be measured. At the very early stages of instrument development, PCA is a statistical tool designed for exploratory data analysis. It is used to identify the structures of different component due to its wider application in the analysis of survey data (Pallant 2010). The purpose of PCA is the reduction of linear combination values from the original variables. The Kaiser-Meyer-Olkin (KMO) measure was used to determine the level of adequacy on values under variances (Pallant 2013). The coefficient of KMO permits the quality of the scale to assess the use of SPSS is to generate statistical measures, which allows the use of different techniques on the data, such as factorability. Also, KMO is used to measure Bartlett's Test of Sphericity and the adequacy of a sample.

For the PCA data to be considered appropriate, it is required that the Barlett test of a sphere is relevant such that it becomes ( $p < .05$ ); that is, each construct should reach this value. It is expected that the KMO value will range from 0 to 1; also a value of 0.6 for

PCA is the minimum recommendation (Tabachnick & Fidell 2007). Based on this study, the results of the two PCAs carried out were  $p < .05$  for the Barlett's test value, and more than 0.71 for the KMO value. Therefore, the two values are suitable for this study.

Cronbach's alpha was used to check the reliability of the measurements used in the research. Demographic variables were used to understand the different aspects of the research sample. Correlation was used to measure the relationship between variables, while regression was used in the estimating process to determine relationships among variables (Pallant 2013).

The steps used in the quantitative data analysis are based on a modified approach used by Urbach et al. (2010) and Koronczai et al. (2011) in their studies. Urbach (2010) used these steps to analyse data in a study investigating employee portal success in 22 companies. The first step of the data analysis is the PCA to confirm whether the 37 items used actually measure the seven constructs, and to help in the data reduction. The second step of the analysis is the determination of the reliability and validity of the data. Determining the reliability and validity of the data ensures the internal consistency of the data and also makes sure that the items used to measure the constructs measure the constructs adequately.

The next step in the data analysis is to carry out regression analysis. The data set for analysis was downloaded from the Bristol Survey online database into an Excel spreadsheet, coded and then imported into SPSS for the reliability analysis. The ANOVA is used to check the significance of the multiple regressions.

### **5.1.2 Gender**

The researcher included only male participants in this study to investigate the HRIS impact on HR Departments of Saudi public universities, as only male staff members administered the HR Departments of the selected universities. Female participants were not selected for this study because of the social and cultural barriers between males and females in Saudi Arabia. Furthermore, Saudi regulations do not allow the mixing of males with females, which made it difficult for the researcher to access female participants at female universities.

The first step of the analysis is discussed in the next section.

### **5.1.3 Demographic Variables and Response Rate**

In total, 368 online surveys were distributed via emails to HR employees, staff, and professionals in the five Saudi public universities. Of these, a total of 250 questionnaires were completed. The response rate was: 68.47 per cent. A 100 per cent response rate is desirable in any survey, however this is rarely achieved in practice (Miller & Acton 2009). Nulty (2008) compares the response rates between face-to-face and online surveys and finds that well conducted face-to-face surveys achieve a higher response rate (60 per cent to 80 per cent) than online surveys. The study response rate of 68.47 per cent is considered a good percentage. The reasons for non-response in this case included the time that participants have available to complete the survey. It must also be acknowledged that the length of a survey may negatively influence the response rate (Brace 2008). In this case, the survey included elements of the Theory of D&M IS success model that consist of six constructs, (system quality, information quality, service quality, system use, user satisfaction, and HRIS adoption), in addition to the potential influencing variable (subjective norm). All variables were important in order to meet the research objectives of the research and were required for accurate assessment; thus, the length of the survey could not be reduced.

The chief characteristics of the 250 respondents, which included age, level of education, and Internet experience, are presented in Tables 5.1 to 5.3. As can be seen from Table 5.1, the majority of the respondents (43.6 per cent) were in the age range of 35 to 44 years, with 35.6 per cent of the respondents were aged between 25 and 34. Of the older respondents, the sample included 15.6 per cent in the age group 45 to 45 years but only 1.2 per cent were 55 or above. The age classification shows that the age group from 25 to 44 years made up 79 per cent of the sample, thus comprising the majority of the respondents.

The frequency table (Table 5.1) for the age groups is given below:

<b>Table 5.1. Age</b>			
		Frequency	Percent %
Valid	1 from 18 to 24	10	4.0
	2 from 25 to 34	89	35.6
	3 from 35 to 44	109	43.6
	4 from 45 to 54	39	15.6
	5 from 55 and above	3	1.2
	Total	250	

In the sample, the demographic analysis based on education can be divided into five educational levels: 34.8 per cent had bachelor's degrees, 14.8 per cent had some high school qualifications, and 27.2 per cent had Master's degrees. However, the education level with the lowest percentage of participation was college level (10.4 per cent), while 12.8 per cent of the participants had PhDs. The demographic analysis indicated that all levels of education were well represented in each of the HRM employee departments. This is an indication that the data obtained were useful for the purpose of the research aims, because they provide different views from each of the employees of the various HR Departments. The frequency table (Table 5.2) is given below:

<b>Table 5.2. Education Level</b>			
Education Level		Frequency	Percent %
Valid	Some high school qualifications	37	14.8
	College	26	10.4
	Bachelor's Degree	87	34.8
	Master's degree	68	27.2
	PhD degree	32	12.8
	Total	250	

The sample consisted mostly of advanced level computer users (54 per cent), with intermediate users accounting for 25 per cent of the sample. A large percentage of participants use a computer on a daily basis (96.4 per cent). Computer use is detailed in the table (Table 5.3) below:



Table 5.3. Computer Use			
Computer Use		Frequency	Percent %
Valid	Never	1	.4
	Daily	241	96.4
	Weekly	8	3.2
	Total	250	100.0

Also, the respondents were experienced in using the Internet, as 70.4 per cent of the sample had more than seven years' experience, while 22 per cent had five to seven years' experience. The percentage of respondents with experience between three and five years was 7.6 per cent.

#### 5.1.4 Appropriateness of Factor Analysis: Sampling Adequacy for a Set of Variables

To check whether the sample was adequate for factor analysis, the KMO value needed to be measured. A KMO value of 0.6 and above with a significant Bartlett's Test of Sphericity indicates that the sample is adequate for factor analysis (Pallant 2013). The KMO was conducted in SPSS, and the results are shown in Table 5.4.

Table 5.4. KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.906
Approx. Chi-Square		5965.236
Bartlett's Test of Sphericity	Df	496
	Sig.	.000

It is evident from Table 5.1 that the value of the KMO measure of sampling adequacy for this data set of variables was .91, which indicated that the sample was adequate for factor analysis. In addition to KMO, Bartlett's Test of Sphericity was also significant (p

<.05). The next stage of the data purification was to scan through the total variance explained in Table 5.5.

<b>Table 5.5. Total Variance Explained</b>						
Components	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.768	36.775	36.775	5.267	16.460	16.460
2	3.971	12.409	49.184	4.144	12.949	29.409
3	2.055	6.422	55.606	3.903	12.196	41.605
4	1.915	5.984	61.590	3.121	9.755	51.360
5	1.462	4.570	66.160	2.998	9.368	60.727
6	1.186	3.706	69.866	2.174	6.795	67.522
7	1.015	3.172	73.038	1.765	5.515	73.038

In the total column, all factors with an Eigenvalue of 1 and above were extracted. This resulted in seven factors with Eigenvalues of 1 and above. These seven factors explained 73.038 per cent of the components.

### 5.1.5 Scree Plot

Based on Table 5.1, seven factors can be retained. However, many factors are usually extracted using the Kaiser criterion. Therefore, it is important to use an alternative tool to cross-verify the factor selection.

Catell's (1966) scree plot test was carried out to determine the number of factors to be retained. An inspection of the scree plot (Figure 5.1) revealed that only seven components could be retained for further investigation. The seven factors that were retained were:

- System quality

- Information quality
- Service quality
- Subjective norms
- System use
- User satisfaction
- Organisation HRIS adoption

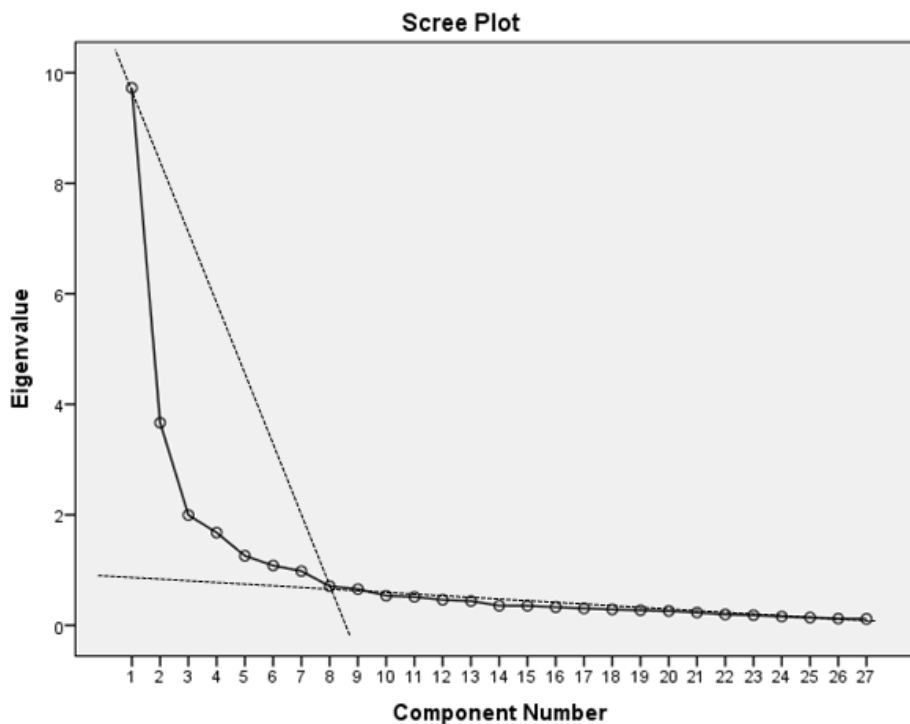


Figure 5.1. Scree Plot for Component Extraction

On a scree plot, the choice of factors is made at the point of inflection. On the scree plot, seven factors above the dashed lines' intersection are chosen.

### 5.1.6 Communalities Measures

Next are the estimations of communalities. Communalities represent the proportion of the variance in the original variables that is accounted for by the factor solution (Pallant 2013). This is the estimate of that part of the variability in each variable that is shared with other variables and which is not due to measurement error or unobserved variable influence on the observed variable. The factor solution should explain at least half of each original variable's variance so that the communality value for each variable should

be 0.50 or higher. As can be seen in Table 5.6, all the communality values are more than 0.5, which shows the overall assessment of the performance of the model.

<b>Table 5.6. Extraction method: Principal component analysis</b>	
Items	Extraction
HRIS is easy to navigate.	.691
HRIS allows me to easily find the information I am looking for.	.727
HRIS is easy to use.	.747
HRIS offers comfortable access to all the business applications I need.	.696
The information provided by our HRIS is useful.	.612
The information provided by our HRIS is understandable.	.452
The information provided by our HRIS is interesting.	.639
The information provided by our HRIS is reliable.	.806
The information provided by our HRIS is complete.	.811
The information provided by our HRIS is up-to-date.	.725
The responsible service personnel are always highly willing to help whenever I need support with the HRIS.	.755
The responsible service personnel provide personal attention when I experience problems with the HRIS.	.731
The responsible service personnel provide services related to the HRIS at the promised time.	.627
People whose opinions I value would approve of my using HRIS in my daily work routine.	.679
People who are important to me would approve if I used HRIS in my daily work routine.	.786
People who influence my behaviour would think that I should use HRIS to finish my daily work tasks.	.747
It is expected of me to use HRIS in my daily work routine.	.751
HRIS has met our expectations.	.767
The employees of HR Department appear to be satisfied with our HRIS.	.544
Overall, I am satisfied with our HRIS.	.729
I use HRIS to retrieve information.	.656
I use HRIS to publish information.	.688
I use HRIS to communicate with colleagues.	.758
I use HRIS to store and share documents.	.752
I use HRIS to retrieve my colleagues' contact information.	.838
I use HRIS to network with colleagues.	.806
I use HRIS to execute work processes.	.828
HRIS has helped my university to improve the efficiency of internal operations.	.836
HRIS has helped my university to improve the quality of working results.	.876
HRIS has helped my university to enhance and improve coordination within the university.	.852
HRIS has helped my university to enhance and improve collaboration within the university.	.724
HRIS has helped to distinguish my university from similar universities.	.737

### **5.1.7 Principal Component Analysis**

Factor analysis is a method used to reduce a large number of commonly related items into a variable. Within a questionnaire, different items can represent a trait. The commonly related items adhere to a trait, thus forming a factor. Sample size plays an important role in the reliability of factor analysis. Field (2009) suggests that over 300 cases show that an adequate choice for factor analysis is with communalities in the range of 0.5. The variables involved in forming a construct should be inter-correlated, as they measure the same theme.

Exploratory factor analysis (EFA) was carried out to reduce 37 items (variables) into meaningful constructs. In SPSS, 22 factors were explored using a PCA extraction method with Varimax rotation to determine the instrument validity. A threshold of 0.4 and an eigenvalue larger than 1 were set for factor loading.

In the PCA output, the correlation matrix consisted of many coefficients of 0.3 and above. The KMO value was .91, exceeding the recommended value of .6 (Kaiser, 1970, 1974). Bartlett's Test of Sphericity (Bartlett 1954) reached statistical significance, supporting the factorability of the correlation matrix. However, some factors in the PCA rotated matrix were cross-loading onto different factors. Table 5.7 shows all the factors with cross-loaded items.

Table 5.7. Extraction method: Principal component analysis. Rotation method: Varimax with Kaiser

Normalization.<sup>a</sup> Rotation converged into nine iterations.

Table 5.7. Rotated Component Matrix <sup>a</sup>							
	Component						
	1	2	3	4	5	6	7
HRIS is easy to navigate.				.672			
HRIS allows me to easily find the information I am looking for.				.537		.467	
HRIS is well-structured.	.691						
HRIS is easy to use.			-.352	.761			
HRIS offers comfortable access to all the business applications I need.				.749			
The information provided by our HRIS is useful.				.531			.391
The information provided by our HRIS is understandable.				.402			.350
The information provided by our HRIS is interesting.		.425		.477			
The information provided by our HRIS is reliable.	.843						
The information provided by our HRIS is complete.	.815						
The information provided by our HRIS is up-to-date.				.449			
The responsible service personnel are always highly willing to help whenever I need support with HRIS.							.747
The responsible service personnel provide personal attention when I experience problems with the HRIS.							.702
The responsible service personnel provide services related to HRIS at the promised time.	.436						.487
The responsible service personnel have sufficient knowledge to answer my questions in respect of the HRIS.							
People whose opinion I value would approve of my using HRIS in my daily work routine.					.762		
People who are important to me would approve if I used HRIS in my daily work routine.					.851		
People who influence my behaviour would think that I should use HRIS to finish my daily work tasks.					.744		
It is expected of me to use HRIS in my daily work routine.					.822		
HRIS has met our expectations.	.768						
The employees in the HR Department appear to be satisfied with our HRIS.	.504						
HRIS could be better utilised.	.313					.607	
Overall, I am satisfied with our HRIS.	.676						
I use HRIS to retrieve information.		.669					
I use HRIS to publish information.		.637					
I use HRIS to communicate with colleagues.		.776					
I use HRIS to store and share documents.		.817					
I use HRIS to retrieve my colleagues' contact information.		.828					
I use HRIS to retrieve competence profiles.		.774					
I use HRIS to network with colleagues.		.580	.382				
I use HRIS to execute work processes.		.301	.820				
HRIS has helped my university to improve the efficiency of internal operations.			.798				
HRIS has helped my university to improve the quality of working results.			.818				
HRIS has helped my university to enhance and improve coordination within the university.			.786				
HRIS has helped my university to enhance and improve collaboration within the university.	.657		.305				
HRIS has helped to distinguish my university from similar universities.	.631		.312				
HRIS has helped my university to make itself an overall success.			.328			.441	

Based on the results of the PCA, 10 items out of 37 were deleted because they were either cross-loaded on different components or not adhering to any component; the deleted items are given in Table 5.8.

**Table 5.8. Deleted Items**

<b>The deleted items</b>	<b>Dimensions</b>
<b>HRIS is well-structured.</b>	System quality
<b>The information provided by our HRIS is useful.</b>	Information quality
<b>The information provided by our HRIS is understandable.</b>	Information quality
<b>The responsible service personnel have sufficient knowledge to answer my questions in respect of the HRIS.</b>	Service quality
<b>HRIS could be better utilised.</b>	User satisfaction
<b>I use HRIS to network with colleagues.</b>	Use of HRIS
<b>I use HRIS to execute work processes.</b>	Use of HRIS
<b>HRIS has helped my university to enhance and improve collaboration within the university.</b>	HRIS Adoption Usage
<b>HRIS has helped to distinguish my university from similar universities.</b>	HRIS Adoption Usage
<b>HRIS has helped my university to make itself an overall success.</b>	HRIS Adoption Usage

After rerunning the PCA by excluding the cross-loaded and non-adhering items, the final rotated matrix was obtained and is given in Table 5.9.

**Table 5.9. Rotated Component Matrix<sup>a</sup>**

Items	Component						
	User satisfaction	Use of HRIS	HRIS Adoption Usage	Subjective norms	System quality	Information quality	Service quality
HRIS is easy to navigate.					.682		
HRIS allows me to easily find the information I am looking for.					.609		
HRIS is easy to use.					.750		
HRIS offers comfortable access to all the business applications I need.					.719		
The information provided by our HRIS is interesting.						.561	
The information provided by our HRIS is reliable.						.525	
The information provided by our HRIS is complete.						.586	
The information provided by our HRIS is up-to-date.						.665	
The responsible service personnel are always highly willing to help whenever I need support with the HRIS.							.777
The responsible service personnel provide personal attention when I experience problems with the HRIS.							.684
The responsible service personnel provide services related to the HRIS at the promised time.							.483
People whose opinions I value would approve of my using HRIS in my daily work routine				.751			
People who are important to me would approve if I used HRIS in my daily work routine.				.848			
People who influence my behaviour would think that I should use HRIS to finish my daily work tasks.				.757			
It is expected of me to use HRIS in my daily work routine.				.827			
HRIS has met our expectations.	.810						
The employees of the HR Department appear to be satisfied with our HRIS.	.610						
Overall, I am satisfied with our HRIS.	.766						
I use HRIS to retrieve information.		.627					
I use HRIS to publish information.		.580					
I use HRIS to communicate with colleagues.		.742					
I use HRIS to store and share documents.		.811					
I use HRIS to retrieve my colleagues' contact information.		.837					
I use HRIS to retrieve competence profiles.		.803					
HRIS has helped my university to improve the efficiency of internal operations.			.806				
HRIS has helped my university to improve the quality of working results.			.842				
HRIS has helped my university to enhance and improve coordination within the university.			.806				

Table 5.9. Extraction method: Principal component analysis. Rotation method: Varimax with Kaiser normalization.<sup>a</sup> Rotation converged in seven iterations.



The PCA was carried out to confirm whether the items actually measured the constructs. The next section discusses reliability and validity.

### 5.1.8 Reliability Analysis (Chronbach's Alpha)

Checking the reliability of scales determines the homogeneity of the survey questions to measure the study subject, and the reliability of the study instruments helps the researcher to determine the repeatability of the surveys or questionnaires. The reliability of the study instruments also helps in the generalisation of the study results or findings (Miller and Acton 2009). Cronbach's alpha values close to 1 mean that the questions are able to measure the subject, and values close to 0 indicate that there is no agreement between the study items. A Cronbach's alpha value of 0.7 to 0.8 is an acceptable measure of the internal reliability of the research survey or questionnaire (Pallant, 2010). Table 5.10 presents the reliabilities (Cronbach's alpha) for the key variables used in this study.

**Table 5.10. Reliabilities for Key Constructs**

Constructs	Number of Items	Cronbach's Alpha ( $\alpha$ )
System quality	4	.82
Information quality	4	.81
Service quality	4	.71
Subjective norms	4	.85
User satisfaction	3	.85
Use of HRIS	6	.90
HRIS Adoption Usage	4	.93

Cronbach's alpha was used to calculate the internal consistency of the items in each measurement scale. Overall, Table 5.10 shows that the Cronbach Alpha scores ranged from .71 to .93, indicating that all the scales used in this study had excellent internal consistency.

### 5.1.9 Correlations

Correlation is used when one would like to understand the relationship between two variables, specifically to describe the strengths and the direction of the relationship between the variables (Pallant 2007). A non-parametric correlation was calculated from the Kendall Tau-b test between observed ranked variables and research variables. The results are given in Table 5.11.

<b>Table 5.11. Non-parametric Correlations: Kendall's Tau-b Test</b>							
	System Quality	Information Quality	Service Quality	Subjective Norm	User Satisfaction	Use of HRIS	HRIS Adoption Usage
Age	-.071	-.093	-.094	-.073	-.228**	-.007	-.137**
Education	.044	.024	-.034	-.097*	.093	.080	.040
Computer Skill Level	.043	.066	.012	-.099	.076	-.010	.052
Use of Computer	.102	.097	.102	.051	.123*	.066	.125*
Use of Internet	.036	.067	-.015	.066	.085	.066	.094

\* $p < 0.05$ , \*\* $p < 0.01$

The test indicates that age has a significant negative correlation with HRIS user satisfaction ( $b = -0.228$ ,  $p < 0.01$ ) and impact on the organisation ( $b = -0.0137$ ,  $p < 0.01$ ). As the age of the employees increases, HRIS users are less satisfied. Since the sample age ranges from 18 to 55+, the satisfaction of the younger group is relatively higher than the other three groups. A possible reason for the levels of user satisfaction is awareness of the HRIS system. As the lower age group respondents are relatively new to HRIS use, they are therefore more satisfied than those who have used it for many years or joined the organisation at a later age. Therefore, the higher age group members are less satisfied.

In Saudi Arabia, the older age group relies more on their choice rather than their younger generation or a consensus. As the head of an organisation is more likely to be in the older group, the views of the older age group therefore play a vital role in

decisions related to HRIS implementation and use. Similarly, it can also be seen that age has a negative correlation with organisational impact, indicating that as the age of the employee increases, it has a negative impact on the organisational performance.

<b>Table 5.12. Non-Parametric Correlations: Kendall's Tau-b Test</b>							
	System Quality	Information Quality	Information Quality	Subjective Norm	User Satisfaction	Use of HRIS	HRIS Adoption Usage
System Quality	1.000	.533**	.398**	.271**	.459**	.296**	.451**
Information Quality	.533**	1.000	.414**	.286**	.427**	.338**	.423**
Information Quality	.398**	.414**	1.000	.252**	.385**	.203**	.345**
Subjective Norm	.271**	.286**	.252**	1.000	.308**	.146**	.232**
User Satisfaction	.459**	.427**	.385**	.308**	1.000	.320**	.520**
Use of HRIS	.296**	.338**	.203**	.146**	.320**	1.000	.498**
HRIS Adoption Usage	.451**	.423**	.345**	.232**	.520**	.498**	1.000

\* $p < 0.05$ , \*\* $p < 0.01$

In Saudi culture, members of the older age group rely more on the younger generation based on the demographic analysis of this study. Therefore, self-efficiency and performance decline with an increase in age. However, with the increased use of computers, employees are more satisfied ( $b = 0.123$ ,  $p < 0.05$ ), which has a positive impact on the organisation ( $b = 0.125$ ,  $p < 0.05$ ). On the other hand, education does not play a vital role in HRIS user satisfaction, but it has a significant negative correlation with subjective norm ( $b = -0.097$ ,  $p < 0.01$ ). Therefore, an employee with a higher level of education has a lower level of subjective norm. Similarly, the Kendall Tau-b

coefficient is calculated to find out the correlations between different research variables, and the results are given in Table 5.12.

The test indicates that all of the research variables have positive significant correlations with each other. Multiple linear regressions are carried out to find if the subjective norms, service quality, information quality and system quality are predictors of user satisfaction and HRIS use.

#### 5.1.10 Normality Test

Statistical data can be analysed through parametric or non-parametric tests. To decide which statistical analysis is to be carried out, the normality of the data should be checked. If the data is normal, then parametric tests should be used for analysis. However, if the distribution is not normal, then non-parametric tests can be used. A normality test is carried out to measure if data distribution is normal, and if not, then the alternative hypothesis is applied (Pallant 2013). Carrying out a Kolmogorov-Smirnov (K-S) test can check the normality of the data. A significant result ( $p < 0.05$ ) of the K-S test indicates that the data is not normal. All the variables were checked for the normality and the results are given in Table 5.13.

<b>Table 5.13. Tests of Normality</b>						
	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
System Quality	.078	250	.001	.986	250	.017
Information Quality	.074	250	.002	.989	250	.047
Service Quality	.163	250	.000	.964	250	.000
Subjective Norm	.134	250	.000	.939	250	.000
User Satisfaction	.127	250	.000	.962	250	.000
Use of HRIS	.117	250	.000	.932	250	.000
Organisation Impact	.101	250	.000	.978	250	.001

a. Lilliefors's significance correction

It is evident from the K-S test that the variables fail to be normal ( $p < 0.05$ ); therefore, parametric instead of non-parametric correlations are carried out. The parametric test is a statistical test, which uses physiognomy limitations of population targets to estimate anticipated assumptions about the population. The non-parametric test is the counterpart of the parametric test and assumes that the underlying population is questionable (Hinton et al. 2014). It is also seen as useful in statistical processes that do not rely on the restraining assumptions of the parametric test (Field 2009). However, non-parametric statistics are a better option than parametric statistics for the following reasons:

- The method can be used to test population parameters when the variable is abnormal.
- They can also be used to test hypotheses that do not involve population parameters.
- They can also be used to test hypotheses that are either normal or ordinal.

The computation of non-parametric statistics is easier than that of their parametric counterparts. On the other hand, the method is also associated with some disadvantages as follows:

- Non-parametric statistics are less efficient than parametric ones.
- They use less information than parametric statistics.
- Non-parametric measures are less sensitive when a larger difference for the null hypothesis can be projected (Field 2009).

#### **5.1.11 Regression Analysis**

Regression analysis is a numerical method that estimates the relationship between dependent and independent variables (Horowitz 1981). Regression analysis estimates the conditional expectations of the dependable variables and independent variables given to determine an average (Wisnowski 2001). It shows that the dependent variable is fixed and that the independent variable varies. Regression analysis is widely used today around the world in many fields of study and organisations for analysis (Billings and Crumbly 1996). Regression analysis is applied to test the subjective norms of a population (Montano 1996).

Regression analysis is carried out first by entering all the variables at once into the regression model to check their contribution to the model. Later, the stepwise regression model is run. In stepwise regression analysis, one variable is entered into the model at a time. Variables that contribute to a model are kept in the regression, while the non-contributing variables are discarded. In a stepwise regression, the analysis is carried out in different models, where the final model contains all the models' contributing variables (Olive 2005).

Carrying out a multiple regression model technique tested the proposed HRIS model. In the present study, the regression model technique was carried out at four levels. In level one, the researcher examined the relationship between the independent variables: subjective norm (SN), service quality (SEQ), information quality (IQ) and system quality (SQ) and the dependent variable user satisfaction (URS). In the second level, the relationship between the independent variables: subjective norm (SN), service quality (SEQ), information quality (IQ) and system quality (SQ) and the dependent variable HRIS use was examined. In the third level, user satisfaction and HRIS use were taken as independent variables, and organisational HRIS adoption was used as the dependent variable. Finally, in the fourth level, two analyses were carried out: a correlation analysis to discern the relationship between user satisfaction and HRIS use, and a linear regression model to see the impact of user satisfaction on HRIS use. By carrying out the regression techniques at the fourth levels, the following hypotheses (given in Table 5.14) were tested, and a full detailed explanations of each of the terms of the hypothesis were provided in the literature review.

Multiple regression was used in this scenario as it provides a further level of understanding and testing of the hypotheses; a normal regression model only looks at one variable, whereas the multiple regression model will look at the many different independent variables to predict the dependent variables. Further, it allows for the deeper exploration of topics, which are more real-world than lab-based topics. Although one cannot just aimlessly throw variables into the tests, the variables that are selected must be done so with great care and attention as the study will rely upon them to answer the questions (Pallant 2007). It is therefore concluded that the multiple regression model is the best suited for this study as it will assist in answering the research questions and can therefore assist the researcher in answering the aim of the research. Along with the correlation tests, the researcher can formulate his conclusion to all matters pertaining

to the aims.

**Table 5.14. Hypotheses of the HRIS Model**

<b>H1:</b>	System quality positively affects HRIS use.
<b>H2:</b>	System quality positively affects HRIS user satisfaction.
<b>H3:</b>	Information quality positively affects HRIS use.
<b>H4:</b>	Information quality positively affects HRIS user satisfaction.
<b>H5:</b>	Service quality positively affects HRIS use.
<b>H6:</b>	Service quality positively affects HRIS user satisfaction.
<b>H7:</b>	Subjective norm positively affects the HRIS use.
<b>H8:</b>	Subjective norm positively affects HRIS user satisfaction.
<b>H9:</b>	HRIS use positively affects user satisfaction.
<b>H10:</b>	User satisfaction positively affects HRIS use.
<b>H11:</b>	User satisfaction positively affects HRIS Adoption Usage .
<b>H12:</b>	HRIS use positively affects HRIS Adoption Usage.

### Predictors of User Satisfaction

A regression analysis was carried out to check the effect of system quality, information quality, service quality and subjective norm on user satisfaction. To find the standardised beta values of the variables, all the variables were forced into the model. The standardised beta values are given in Figure 5.2.

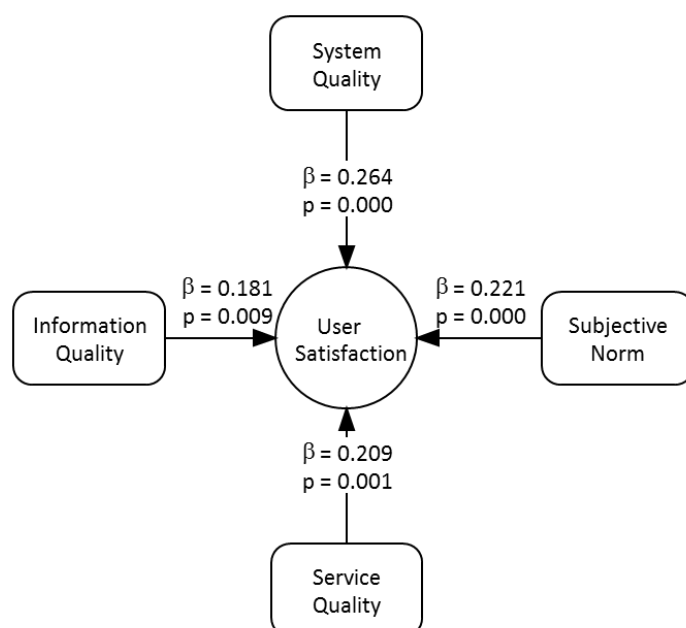


Figure 5.2. Beta Weights of Independent Variables on User Satisfaction

The stepwise regression model was rerun to find the independent variable that contributes to the coefficient of the determinant. It is evident that system quality, information quality, service quality and subjective norm account for 46.9 per cent of the variance in user satisfaction. Regression of the independent variables is significant ( $p < 0.05$ ). Among all four independent variables, system quality ( $\beta = 0.264$ ) and subjective norm ( $\beta = 0.221$ ) make the highest contribution towards user satisfaction.

The associations of these independent variables are given in the coefficient table below.

**Table 5.15. Predictors of User Satisfaction**

Model	R	R <sup>2</sup>	Adjust-ed R <sup>2</sup>	Std. Error of the Estimate	Change Statistics				
					R <sup>2</sup> Change	F Change	df1	df2	Sig. F Change
1	.685 <sup>d</sup>	.469	.460	.595	.015	6.961	1	245	.009

a. Predictors: (constant), system quality, service quality, subjective norm, and information quality.



### Analysis of Variance ANOVA

ANOVA has been used within the model in order to perform a further analysis and gain a deeper understanding of the data. There are two different types of ANOVAs: one-way ANOVA and two-way ANOVA. As suggested in the name, one-way ANOVA looks at only one independent variable, while the two-way ANOVA looks at two or more independent variables. A point to note is that both of these will be univariate tests that will examine the overall effects of the group on a dependent variable (Gay et al. 2006). This test has been used as it allows the researcher to look into the reasons for the adoption of HRIS, thereby answering the research question(s) in relation to this.

The ANOVA table of the regression model with four independent variables (system

<b>Table (5.16):Coefficients<sup>a</sup></b>								
Model		Unstandardised Coefficients		Standardised Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.213	.198		-1.080	.281		
	System Quality	.289	.075	.264	3.868	.000	.467	2.141
	Service Quality	.221	.064	.209	3.485	.001	.604	1.656
	Subjective Norm	.214	.051	.221	4.214	.000	.790	1.265
	Information Quality	.203	.077	.181	2.638	.009	.462	2.167

a. Dependent variable: user satisfaction.

Quality, service quality, subjective norm and information quality) is given in Table 5.17.

<b>Table 5.17. ANOVA<sup>a</sup> of Predictors of User Satisfaction</b>						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	76.620	4	19.155	54.080	.000
	Residual	86.779	245	.354		
	Total	163.399	249			

---

a. Dependent variable: user satisfaction.

The ANOVA table indicates that the result of this model is significant. The total variance explained by the model was 46.9 per cent,  $F(4, 245) = 54.080$ ,  $p < 0.05$ . The model indicates that system quality, service quality, subjective norm and information quality are the predictors of user satisfaction. Therefore, based on the regression model, the outcomes of the hypotheses are given in Table 5.18.

---

**Table 5.18. Results of Hypotheses Test**

Hypothesis	Supported
<b>H2:</b> System quality positively affects user satisfaction.	Yes
<b>H4:</b> Information quality positively affects user satisfaction.	Yes
<b>H6:</b> Service quality positively affects user satisfaction.	Yes
<b>H8:</b> Subjective norm positively affects user satisfaction.	Yes

In the revised DeLone and McLean model, subjective norm was not taken into consideration. However, in the present study, the model shows that subjective norm is a contributing factor. Subjective norm is a factor that motivates user satisfaction. It is quite common in Saudi Arabia for individuals or organisations to compete in every field to achieve their targets. Due to subjective norm, organisations decide to find ways to stand out from their competitors. Organisations can choose a better system than their competitors, which in turn gives them more satisfaction. Therefore, user satisfaction is always affected by the subjective norm.

### **Predictors of HRIS use**

A regression analysis was carried out to check the effects of system quality, information quality, service quality and subjective norm on HRIS use. To find the standardised beta values of the variables, all the variables were forced into the model. The standardised beta values are given in Figure 5.3.

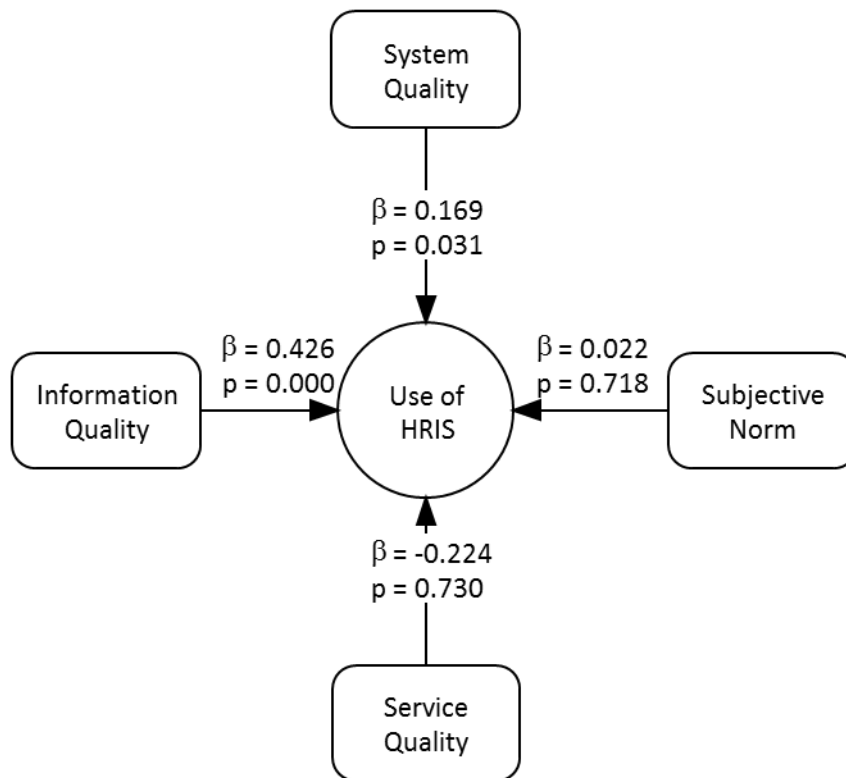


Figure 5.3. Beta Weights of Independent Variables on HRIS Use

The stepwise regression model was rerun to find the independent variable that contributes to the coefficient of the determinant. It is evident from the analysis that two out of the four variables contribute to the model. From the regression model, it is evident that system quality and information quality account for 30.6 per cent of the variance in HRIS use.

Table 5.19. Predictors of HRIS Use									
Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error of the Estimate	Change Statistics				
					R <sup>2</sup> Change	F Change	df1	df2	Sig. F Change
1	.540 a	.291	.289	.675	.291	102.016	1	248	.000
2	.553 b	.306	.300	.669	.014	5.014	1	247	.026

- 
- a. Predictors: (constant), information quality.
  - b. Predictors: (constant), information quality and system quality.

The contribution of the two independent variables is significant ( $p < 0.05$ ). The diagram is given below.

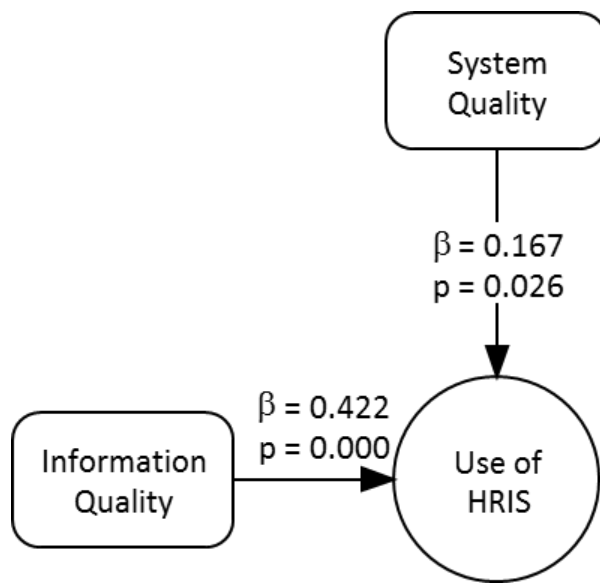


Figure 5.4. Beta Weights of Two Independent Variables on HRIS Use

Among all the variables, one independent variable, information quality ( $\beta = 0.422$ ) had the highest contribution towards HRIS use. The associations of the independent variables are given in the coefficient table below.

<b>Table 5.20. Coefficients<sup>a</sup></b>								
Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.557	.183		8.519	.000		
	Information Quality	.597	.059	.540	10.100	.000	1.000	1.000
2	(Constant)	1.405	.193		7.264	.000		
	Information Quality	.467	.083	.422	5.646	.000	.503	1.987
	System Quality	.181	.081	.167	2.239	.026	.503	1.987

a. Dependent variable: HRIS use

The ANOVA table of the regression model with two independent variables (system quality and information quality) is given in Table 5.21.

<b>Table 5.21. ANOVA<sup>a</sup> of Predictors of HRIS Use</b>						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	48.693	2	24.346	54.341	.000 <sup>c</sup>
	Residual	110.663	247	.448		
	Total	159.356	249			
a. Dependent variable: HRIS use.						
b. Predictors: (constant), information quality and system quality.						

The ANOVA table indicates that the result of this model is significant. The total variance explained by the model was 30.6 per cent,  $F(4, 245) = 19.155$ ,  $p < 0.05$ . The model indicates that system quality and information quality are the predictors of HRIS

use. Therefore, based on the regression model, the outcomes of the hypotheses are given in Table 5.22.

Table 5.23. Predictors of Organisation HRIS adoption Usage									
Model	R	R <sup>2</sup>	Adjust- ed R <sup>2</sup>	Std. Error of the Estimate	Change Statistics				
					R <sup>2</sup> Change	F Change	df 1	df2	Sig. F Change
1	.786 b	.618	.615	.471	.167	107.772	1	247	.000

a. Predictors: (constant), use of HRIS and user satisfaction.

**Table 5.22. Results of Hypotheses Testing**

Hypothesis	Supported
<b>H1:</b> System quality positively affects HRIS use.	Yes
<b>H3:</b> Information quality positively affects HRIS use.	Yes
<b>H5:</b> Service quality positively affects HRIS use.	No
<b>H7:</b> Subjective norm positively affects HRIS use.	No

### Predictors of organisation HRIS adoption

A regression analysis was carried out to check the effect of user satisfaction and HRIS use on organisation HRIS adoption. To find the standardised beta values of the variables, all the variable were forced into the model. The standardised beta values are given in Figure 5.5.

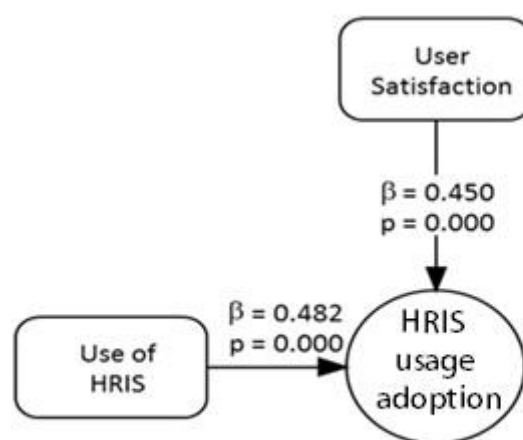


Figure 5.5: Beta Weights of Two Independent Variables on HRIS Use

The stepwise regression model was rerun to find the independent variable that contributes to the coefficient of the determinant. It is evident from the analysis that the standardised beta remains the same, as both of the two variables are predictors of organisational impact. The model summary table is given below. It is evident that system quality, information quality, service quality and subjective norm account for 61.8 per cent of the variance in user satisfaction.

The contribution of the independent variables is highly significant ( $p < 0.05$ ). Among both independent variables, HRIS use ( $\beta = 0.264$ ) had a higher contribution to the organisation HRIS adoption. The associations of these independent variables are given in Table 5.24.

<b>Table 5.24. Coefficients<sup>a</sup></b>								
Model		Unstandardised Coefficients		Standardised Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.360	.137		2.623	.009		
	Use of HRIS	.458	.041	.482	11.126	.000	.822	1.216
	User Satisfaction	.422	.041	.450	10.381	.000	.822	1.216

a. Dependent variable: organisation HRIS adoption usage.

The ANOVA table of the regression model with both independent variables is given in Table 5.25.

Table 5.25. ANOVA <sup>a</sup> of Predictors of User Satisfaction						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	64.790	1	64.790	204.199	.000 <sup>b</sup>
	Residual	78.688	248	.317		
	Total	143.478	249			
2	Regression	88.694	2	44.347	199.943	.000 <sup>c</sup>
	Residual	54.784	247	.222		
	Total	143.478	249			

a. Dependent variable: organisation HRIS adoption usage.

b. Predictors: (constant), HRIS use.

c. Predictors: (constant), HRIS use and user satisfaction.

The ANOVA table indicates that the result of this model is significant. The total variance explained by the model was 61.8 per cent,  $F(2, 247) = 199.943$ ,  $p < 0.05$ . The model indicates that HRIS use and user satisfaction are the predictors of organisation HRIS adoption. Therefore, based on the regression model, the outcomes of the hypotheses are given in Table 5.26.

**Table 5.26. Results of Hypothesis Test**

Hypothesis	Supported
<b>H11:</b> User satisfaction will positively affect organisational HRIS adoption usage.	Yes
<b>H12:</b> HRIS use will positively affect organisational HRIS adoption usage.	Yes



It is evident from the above hypotheses that organisations will have a positive effect due to HRIS user satisfaction. If the user is satisfied, then they will use the system, which will benefit the organisation by enhancing organisational efficiency.

### 5.1.12 Linear Regression

A linear regression analysis is carried out to test the H9 and H10 hypotheses. Linear regression is a process for modeling the relationship between variable X and variable Y, which in other words is known as simple linear regression. This was the first type of regression analysis to be studied and extensively used in the history of statistics because linear models are easier to fit in an analysis between Y and X (Korkhin 2009). A simple linear regression predicts the next second variable score, and it measures between two points and assumes there will be two predictors. When there is only one predictor, the variable becomes a simple linear regression (Korkhin 2009).

The standardised beta values are given in Table 5.27.

<b>Table 5.27. Model Summary</b>									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df 1	df 2	Sig. F Change
1	.421 <sup>a</sup>	.178	.174	.736	.178	53.525	1	248	.000

a. Predictors: (constant), HRIS use.

From the regression model, it is evident that HRIS use accounts for 17.8 per cent of the variance in user satisfaction. The contribution of HRIS use is highly significant ( $\beta = 0.421$ ,  $p < 0.05$ ). HRIS use ( $\beta = 0.264$ ) makes a high contribution towards the organisational HRIS adoption. The association of HRIS use is given in Table 5.28.

<b>Table 5.28. Coefficients<sup>a</sup></b>									
Model		Unstandardised Coefficients		Standardised Coefficients	T	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	1.172	.201		5.836	.000			
	Use of HRIS	.427	.058	.421	7.316	.000	.421	.421	.421

a. Dependent variable: user satisfaction

The ANOVA table of the regression model is given in Table 5.29.

<b>Table 5.29. ANOVA<sup>a</sup> of Predictors of User Satisfaction</b>						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	29.006	1	29.006	53.525	.000 <sup>b</sup>
	Residual	134.393	248	.542		
	Total	163.399	249			

a. Dependent variable: user satisfaction

b. Predictors: (constant) HRIS use

The ANOVA table indicates that the result of this model is significant. The total variance explained by the model was 17.8 per cent,  $F(1, 248) = 53.525$ ,  $p < 0.05$ . The model indicates that HRIS use is a predictor of user satisfaction. Therefore, based on the regression model, the outcomes of the hypotheses are given in Table 5.30.

**Table 5.30. Results of Hypotheses Test**

Hypothesis	Supported
<b>H9:</b> HRIS use will positively affect user satisfaction.	Yes
<b>H10:</b> User satisfaction will positively affect HRIS use.	Yes

### **5.1.13 Summary**

In this chapter, the findings from the quantitative phase have been presented, and these have been derived from the data analysis of data collected from the 250 respondents involved in this study. The hypotheses proposed in Chapter Two were tested by analysing the data and the relationships between various constructs of the HRIS conceptual model shown in Chapter Two. The reliability of the scales used in this study was assessed using Cronbach's alpha test, and the normality of the data was assessed with a normality test. An exploratory factor analysis was carried out to find the underlying variables, and the regression model was used to check the validity of all hypotheses. The present research was designed to confirm the benefits of the HRIS adoption model and the constructs that have been built by earlier researchers. Specifically, this study aimed to build a HRIS adoption model by modifying earlier widely used models, in order to investigate HRIS use in public universities in Saudi Arabia. The PCA technique was used to reduce the data and confirm the items used to measure the construct.

The findings of this study showed that there is a positive and significant influence of all the independent variables (subjective norm, system quality, service quality, and information quality) on the dependent variables (use and user satisfaction). However, the information and system constructs have a positive and significant influence on the use of HRIS. Nevertheless, service quality and subjective norm do not have any influence on HRIS use. Subjective norm and service influence exert an indirect influence on the use of HRIS by affecting user satisfaction significantly. Both user satisfaction and the use of HRIS significantly affect each other. In addition, this study showed the significant relationship between user satisfaction and the use of HRIS with the HRIS adoption of the organisation. The next chapter will discuss the findings by discussing the results of the data analysis to demonstrate each hypothesis used in the study.

## **Chapter 6: Discussion**

### **6.0 Introduction**

The previous chapter presented the findings of phase II of the research. The formulated research hypotheses were tested with different techniques such as the multiple regression model. The techniques enabled the successive achievement of the statistical analysis and the formation of the results. The results of the quantitative analysis were used to provide a better explanation of the major challenges that were recognised in this work. The key challenges were used to link any aspects that affect HRM personnel's use of HRIS. Thus the finding will help to provide an explanation of the impact of HRIS on HR Departments. The work will therefore present each of the components that make up the model in detail with their impact and non-impact.

This chapter reflects on the main research findings obtained from the qualitative Phase I and quantitative Phase II, offering an understanding of the impact of HRIS on HRM practices in Saudi public universities in the context of past and future research and the presentation of an overall HRIS use model. Therefore, this chapter discusses the major findings of the impact of HRIS on HRM staff.

### **6.1 Discussion of Findings**

#### **6.1.1 Current HRIS in the Context of Saudi Public Universities (Phase I Findings)**

HRIS constitutes a revolution in the field of HRM (Al-Khowaiter et al. 2014) and therefore can be considered integral to the day-to-day activities within Saudi Arabian public universities. Organisations use HRIS for different reasons, including sanitising IS management in HR Departments, faster communication in HR and as a more reliable medium to pass on information within the HR scope (Kumar & Parumasur, 2013).

The next section discusses the findings from the qualitative Phase I.

##### ***6.1.1.1 Research Objectives of Phase I***

The first objective of Phase I is to explore the current level of use and effectiveness of HRIS in Human Resource departments in Saudi public universities. For this objective, ten interviews were conducted with HRM managers and professionals in the public

universities in Saudi Arabia. The findings of this objective were analysed and presented in the findings chapter (3.1.1). This objective will be further discussed in the following section, taking into account how the previous literature has addressed this subject.

The second objective of Phase I was to explore the most appropriate dimensions that influence the use and adoption of HRIS in HR Departments in the public universities in Saudi Arabia. As mentioned earlier, ten semi-structured interviews were carried out to achieve this objective. Interesting social patterns emerged from analysing this objective finding, which were set out in previous sections. This will be discussed in detail in the next sections.

#### ***6.1.1.2 Existing Use of HRIS by Saudi Public Universities***

One of the objectives of this study was to explore the extent of use of HRIS in the HR Departments of public Saudi universities. The findings of the qualitative phase achieved this objective by showing that the current level of use is affected by lack of customisation and a unified system, inadequate training, poor system, poor service quality and hindrances to the use and implementation of HRIS. Also, one of the respondents emphasised that in their university, when the HR Department send information to other departments within their university in an email message, they receive a paper-based reply. This shows that many departments are not really aware of how the system works or they have not undergone proper training, and that alone will affect the existing views of HR about HRIS. Consequently, the current use hampered the view of HR about HRIS use, due to the poor quality of the system, service quality awareness, ease of use, flexibility, and training.

Furthermore, the findings of the qualitative phase showed that usefulness is an important parameter for HRIS use, and participants of the AQU, HU, and SU are aware of this fact, while participants from WBU and AJU showed a lack of awareness. The participants supported the usefulness of HRIS for their daily activities. HR professionals working in Saudi public universities favoured greater use of the HRIS in their departments if they perceived greater benefits for their daily activities and operations. Kuvach et al. (2002) reported that usefulness is often an overlooked aspect during the promotion of the use of HRIS applications within organisations.

The users of HRIS cannot fully benefit from the applications until they know what they are using and what they are using it for. The findings also revealed that HRIS use could not be increased until it was designed to save time and reduce actual costs. This is in line with the findings reported by Targowski and Deshpande (2001), who suggested that the use of HRIS applications in organisations has to cast a positive impact on traditional operations, such as selection, recruitment, development and training. HR professionals and managers of Saudi universities are well aware of the functions and usefulness of the HRIS.

It is also observed that the purported advantages of HRIS for Saudi universities are to reduce the time spent on tasks and other routine HR activities, which is supported by the study by Kovach and Cathcart (1999). Furthermore, this study reveals the main factors prompting HRIS use in the Saudi public universities. The important factors include assistance in the decision-making process, speeding up the decision-making process, fulfilling assessment and training needs, and upgrading traditional HR processes, such as employee recruitment. These factors are mediators for increasing organisational performance and productivity. The basic function of HRIS applications is to enable the users of the system to produce effective decisions, rather than simply creating channels for fast data processing (Lippert & Swiercz 2005).

These findings are supported by several other studies (Troshani et al. 2011, Hussain et al. 2007, Maier et al. 2013). These studies suggest that data management through HRIS allows the members of organisations in general, and HR seniors in particular, to make effective decisions in terms of organisational effectiveness. Hussain et al. (2007) further showed that the quality of the decision-making process depends on the quality of information, systems and services. That is why the interrelationship of service quality, system quality and service quality holds critical value for effective HRIS use. The measurement of the influence of quality dimensions on the usage of HRIS applications has been shown to be positively correlated with use and user satisfaction; this fact was demonstrated in the quantitative phase of this study. Also, the outcomes of the qualitative phase were supported by the quantitative phase.

The data obtained from the qualitative phase indicated that system quality and HRIS ease of use are essential factors for motivating HR managers and professionals to use the HRIS applications. The study found that if these dimensions were poorly organised

and structured while designing the HRIS, the users' inclination towards the usage of HRIS application decreased. This clearly demonstrates that whatever the design of HRIS, two dimensions must be considered – system quality and ease of use – which can represent the measure of success and net profit for organisations (Gable et al. 2008). Therefore, it is essential to put in place the measures and methods to evaluate these dimensions. According to Ifinedo and Nahar (2007), system quality can be assessed by taking ease of use into consideration, which is incompatible with the data provided by this study. Due to the importance of system quality for HRIS use and net organisational benefit, this study was designed to assess the relationship of system quality with use and user satisfaction.

The participants of the qualitative phase of this research also demonstrated that timeliness, flexibility and content are critical for increasing HRIS use in Saudi public universities. In short, system quality is coupled with many factors, including timeliness, ease of use, authorisation, and content and flexibility, which must be supported by the HRIS. Consequently, these factors will increase user satisfaction, HRIS use and ultimately organisational performance.

The lack of training and expertise to use the HRIS in the HR Departments of Saudi universities is another interesting finding reported by this study. Although the choice of system is important, the integration of the right applications and archives that allow users to avoid mistakes and decrease the cost of transferring data from one place to another are also very important. The real HRIS benefits can be achieved with the provision of proper training for employees (Lassila and Buchner 1999). According to Bradley and Lee (2007), HRIS use within an organisation can be promoted by re-engineering the HRIS in accordance with users' needs. Similarly, Umble et al. (2003) emphasised that the training needs of the users in terms of understanding and implementing the tasks through HRIS are critical success factors for successful HRIS use within organisations. The use of HRIS applications requires knowledge, education and training to implement a system that can solve problems.

This research also found that the customisation of HRIS is not always appropriate, as it can cause dissatisfaction among the users. As the qualitative phase showed a positive relationship between HRIS use and user satisfaction, the lack of customisation can result in decreased use of HRIS. Based on the definition of Rothenberger and Srite

(2009:2), *customisation* is related to “building custom features by using standard programming language, changing the HRIS code and/or including third-party packages that require some degree of programming to implement”. Therefore, customisation means that software packages are typically purchased or borrowed from a third party that configures them according to the users’ requirements. This indicates that bad user experiences with the customised HRIS features, in this case, can derail the process of implementing and increasing HRIS use by the leadership of Saudi public universities.

#### ***6.1.1.3 The Role of Social pressure***

Social pressure can influence the usage of IT in HR. This is an important finding of this study, especially in the environmental setting of Saudi Arabia. The findings pertaining to the impact of social elements are described in Chapter 4 (section 4.1.8). The impact of social influence on the usage patterns of technology is often defined as the subjective norm. According to Fisherbein and Ajzen (1975: 302), subjective norm is “A person’s perception that most people who are important to him (users) think that he should or should not perform the behaviour in question”. The rationale for including the impact of subjective norm on the intention to use HRIS is based on the proposition that employees in the HR Departments of Saudi universities may opt to use new technology through peer pressure, even though they may not be inclined to use it, as suggested by Strohmeier (2010).

The main drivers identified by this study behind the HRIS infrastructure in the public universities of the KSA include HR peers at public and private educational institutions competing with each other to use HRIS. This situation puts pressure on HR personnel to use the HRIS in performing their routine tasks on a daily basis. The employees of HR Departments in the selected universities were of the view that their competitiveness in the education field could be affected if they did not use HRIS. This clearly demonstrates that HR personnel were found to be using HRIS without volunteering to use it.

However, the intention to use HRIS seems to be more tied to social influence. The management’s intention to fully promote HRIS use is in line with the competitive pressure sprouting from the public and private universities in the KSA. In the current study, HR personnel were found to be feeling heightened pressure from management



and the university administration to use the HRIS to outcompete their competitors. This finding conforms to Hussain et al. (2007), who suggested that managers of large companies affect the intentions for HRIS use in their companies. However, they showed that managers of some companies had a marginal impact on the intention to use of the employees working in HR Departments. This might be due to the fact that managers in other companies are not well equipped to deal with the resistance arising from the change.

Furthermore, some companies have fewer requirements for HRIS functions, and their implementation is restricted to specific employees having expertise in HRIS tools. Therefore, they may have less influence on overall performance and the usage patterns of employees working on various tasks. The pressure from competitors influencing managers' and administrators' attitudes towards HRIS use is also reported by Al-Shawabkeh (2014), who studied the Jordanian banking sector. He found that competition in the banking sector in Jordan stimulated the management of various banks to use HRIS, as they were considered essential tools for organisational performance and the implementation of HR strategies within the organisations.

Our study also found that colleagues and peers within the cultural set-up of organisations in the KSA had a substantial effect on HRIS intentions to use. Being a developing nation, the KSA has a number of older HR employees who prefer manual processes to technological ones. They advise young newly recruited workers to use a manual system rather than HRIS. In this way, their advice and influence – being older and experienced – may affect the work of young employees.

Our study suggests that peers' and colleagues' influence may slow down the HRIS use rate in the HR Departments of the universities in the KSA, and this finding stands in agreement with the findings reported by Bal et al. (2013), Al-Mobaideen et al. (2013) and Chi and Hung (2012). Similarly, Taylor and Todd (1995) and Schepers and Wetzels (2006) showed that subjective norm has a significant impact on HRIS adoption and use, whereas Matjieson (1991) reported that social influences (subjective norm) did not have a significant impact on the intentions for HRIS use.

In contrast to findings obtained from this study, Yusliza and Ramayah (2011) identified subjective norm and behavioural controls of the user as weak predictors of the intention to use electronic HRM packages among HR professionals in a pilot study. However,

Eckhardt et al. (2009) suggested that management considerably impacted HRIS use compared to peers and colleagues (users and non-users). However, the perceived usefulness of HRIS by HR managers in their efforts to implement the systems was found to be the main driver in mediating HRIS use, which is an interesting finding of this study.

The contrasts and variations of the findings of the current study with the other studies mentioned above may be attributed to differences in culture. Most of the foregoing studies, which reported that subjective norm did not affect the intention to use HRIS, were conducted in European and Eastern countries, and their cultural ties are not as closely linked as those of Middle Eastern countries (Hofstede 1990). The opinions and suggestions of colleagues in the KSA are highly regarded and esteemed; therefore, their lack of support can lessen the impact of attempts made to increase the HRIS use. This has resulted in the failure of HR managers' attempts to increase the HRIS use without installing change management strategies within the HR Departments of the universities. In the next section, the quantitative findings on the influence of subjective norm on HRIS use are discussed.

### **6.1.2 Assessment of Relationships in the Conceptual Framework (Phase II Findings)**

#### ***6.1.2.1 Phase II: Research Objective***

- The first objective of Phase II was to propose a conceptual HRIS framework for examining the adoption and use of HRIS in the public universities of Saudi Arabia.
- The second objective of Phase II was to test empirically the proposed conceptual HRIS framework in the HRM departments of Saudi public Universities.
- The third objective of Phase II was to provide organisational recommendations based on the finding of this study for the Saudi public universities.

#### ***6.1.2.2 Relationship between Subjective Norm and the DeLone and McLean Model of Information Systems Success***

The data obtained from the qualitative phase of this study demonstrated clearly that subjective norm plays an important role in the successful use of HRIS in the context of public universities in the KSA. Therefore, it was hypothesised that subjective norm might positively affect user satisfaction. The results provided by the quantitative phase of this study supported the hypothesis by showing that subjective norm does have a significant influence ( $p < 0.05$ ) ( $B = 0.221$ ) on user satisfaction (results can be seen in Table 5.16. This is one of the novel findings of the current study, which for the first time shows that subjective norms influence user satisfaction and promote HRIS use. In the revised model of HRIS adoption put forward by DeLone and McLean, this dimension was not included, and several researchers have referred to the need for investigating this aspect, as it is considered a vital determinant of human behaviour. According to the theory of reasoned actions (TRA) presented by Ajzen and Fishbein (1977), the behaviour of an individual related to performing certain actions depends on the widely held beliefs about the consequences and an effective evaluation of the action. In this way, the social and cultural beliefs about the consequences of certain actions or behaviours are main forces behind the adoption of a particular behaviour.

The research data showed that subjective norm is an important determinant of the successful use of HRIS in universities in the KSA, and this emphasised the need to incorporate subjective norm into the DeLone and McLean HRIS model. This finding assumes a great significance by taking the working environment of the Arab countries into consideration, where the use of IS instruments are considered mandatory. The authorities' and colleagues' beliefs about the usage of IS tools play a critical role in the Arab world. Culturally, Arabs fear the uncertainties and risks of adopting new things. Consequently, they are more inclined towards following the existing norms and beliefs about certain actions and behaviours.

According to AlQaisi (2009), the impact of subjective norms on user satisfaction is not significant in a voluntary context; however, he seems to suggest that the case may be different in the context of mandatory settings. It can be argued that the significant impact of social elements (subjective norm) on HRIS use is due to mandatory settings at the work place in the Arab world. The findings of AlQaisi (2009) support the

outcome of the present study by showing the positive impact of the subjective norm on HRIS user satisfaction. This study also showed that the subjective norm positively and significantly affected user satisfaction with HRIS. The results can be seen in Table 5.16. Similarly, Venkatesh et al. (2003) and Venkatesh and Davis (2003) support the findings of this study by positing that subjective norms' influence on HRIS user satisfaction is significantly high in mandatory settings. Nevertheless, these studies did not explain the mechanism for the effect of the subjective norm on HRIS user satisfaction. Thus the findings of the current study support the data from the above studies, and confirm that within compulsory settings, the subjective norms positively affect HRIS users' satisfaction within the organisations. The real mechanism working behind the significant impact of subjective norm on the user satisfaction with HRIS is related to the cultural values, for example, the tendency of young people to do things according to the advice and suggestions of their peers, relatives and friends.

This phenomenon is stronger in collectivist societies like the Saudi Arabian society and in other Arab countries. In Saudi society, people, unlike in European societies, rarely execute things independently, and they seek advice from their peers before adopting or using services, products or technology (Hofstede, 1984). As mentioned earlier, use of technology has been reported to be non-significant in the case of voluntary settings, and the use of HRIS becomes significant when the settings are mandatory, recommended or directed by peers (Venkatesh et al. 2003). The settings in Saudi Arabia are mandatory, and this leads to the adoption of HRIS in the public universities of Saudi Arabia under the advice, directives and recommendations of the peers of the employees. Furthermore, the current study revealed that the subjective norm construct mediates the influence on user satisfaction, thereby incrementing the usage rate of HRIS within Saudi universities, especially in countries having a high uncertainty level on the Hofstede cultural index (Hofstede 1984). Within mandatory settings, the opinions and beliefs of peers, colleagues, and supervisors cannot be ignored in terms of IS/HRIS usage. In other words, the social pressure affects the users' intention to use the system. Based on this premise, the current study hypothesised that subjective norm positively affects HRIS use. However, this research showed that social influence did not have a significant effect ( $p > 0.05$ ) on HRIS use. Nevertheless, it influenced the use of HRIS indirectly by exerting a significant influence on user satisfaction, and this study reports that there is a significant relationship between user satisfaction and HRIS use. In this

way, subjective norms indirectly affect HRIS use through their impact on user satisfaction.

Furthermore, this study proposes a revised version of the model of HRIS success originally presented by DeLone and McLean to include subjective norm for those organisations having mandatory settings, such as the public universities in the KSA. There are also implications for the management and leadership of public universities in the KSA to put more focus on the subjective norm and the behavioural and psychological processes associated with it. Consequently, changing the focus could increase user satisfaction, which in turn could enhance HRIS use within the HR Departments of Saudi public universities.

Taken together, the subjective norm positively influences the use of HRIS and the users' satisfaction, and increases the use of HRIS for the smooth running of HR Departments in Saudi public universities. A profound effect is exerted on the use of HRIS by increasing the user satisfaction, which shows that subjective norm plays a critical role in the use of HRIS.

#### ***6.1.2.3The Impact of System Quality on HRIS Use and user satisfaction***

It was hypothesised that system quality, as a HRIS dimension, has a positive influence on HRIS use in public universities of Saudi Arabia. This research supported the hypothesis that there is a significant relationship between system quality and HRIS use ( $p < 0.026$ ), ( $B=0.167$ ). In the proposed HRIS model, the results of this dimension can be viewed in Table 5.20. Noordin et al. (2013) showed that the system quality of a knowledge management system was positively correlated with IS usage in the Malaysian context. These data are consistent with the findings of this study.

Similarly, Targowski and Deshpande (2001) argued that without ensuring the system quality of an IS, the use of HRIS cannot be implemented at the organisational level. Moreover, Wang and Laio (2008) reiterated that the maintenance of system quality is imperative for implementing several functions within organisations, including personnel administration, employee recruitment, knowledge management, time management, labour relations, pension administration, and health and safety management. Likewise, in agreement with the findings of the current study, Lori and Elaine (2002) demonstrated that system quality exerts a positive influence on IS use and further revealed that system quality impacts HRIS performance, appraisals of

software performance and assessments of discrepancies generated during HRIS operations.

Therefore, system quality should be ensured by conducting performance appraisals of the software packages being used at the HR Departments in Saudi public universities. In turn, these appraisals can lead to increases in system quality through the detection and correction of anomalies in data presentation. The quality of the management of human capital and organisational resources also depends on system quality (Anitha & Aruna, 2014). By improving system quality, the various organisational tasks related to the performance of employees, training and the needs of the organisation could be implemented effectively. Similarly, the findings reported by Alshibly (2014) and Al-khowaiter et al (2013) showed that system quality significantly improved the level of use of HRIS in the Jordanian governmental ministry. This clearly supported the outcomes of the current study, noticeably, both studies are taken in the middle eastern countries and in the public sector organizations. This lends a strong support to the findings of the current study regarding the significant relationship between the system quality and the use of HRIS in the public sector organizations. Another study conducted by Petter et al (2009) performed a meta-analysis of Delone and McLean IS Success Model, and showed that at least 26 studies supported the significant relationship between the use of HRIS and system quality, thus supporting the finding reported by current study which showed that significant relationship exists between system quality and the use of HRIS.

In line with the findings of the present study, Shani and Tesone showed a significantly positive relationship between system quality of HRIS and the use of the system. They further suggested that the enhancement of HRIS quality plays a critical role in effective performance management, which is regarded as a cornerstone for the effective implementation of business strategies (Shani & Tesone 2010).

Our study reveals that system quality exerts significant influence on user satisfaction ( $p < 0.000$ ) ( $B = 0.264$ ) (Tables 5.20 and 5.16). Section 5.1.10 of Chapter 5 clearly explains the mechanism by which system quality increases the benefits of HRIS for the organisation. By increasing user satisfaction, system quality undoubtedly has the potential to play a fundamental role in increasing the performance of HR Departments in Saudi public universities.

This finding of our study can be evaluated by considering the importance of effective performance appraisals. For instance, a comprehensive system is required to integrate the specific and essential functions for tracking employees' performance and the evaluation procedures adopted for such a process (Hong et al. 2001, 2002). The interpretation of the results obtained from this study can be laid out as suggested by Halawi et al. (2007) and Iivari (2005): A system's capabilities should meet the users' requirements by making the functions easy to use and by showing that different HRIS applications can successfully generate the required output. Davanrpanah and Mohamed (2013) showed that system quality is analogous to the customised and easy to be handled the system, and leads to the higher user satisfaction with the information systems within higher education institutions contexts. This evidence also supports the finding produced by this study that system quality impacts the users staifaction in the public universities of Saudi Arabia. Chui et al (2007) conducted the research on HRIS use in large sized organizations in India, and found that improvement in the system quality in form of better applications, good IS infrastructure and strong support to maintain them led to the improved satisfaction of users with HRIS. Another study conducted by Alshibly (2014) and Al-khowaiter et al (2013) in the Middle eastern context, and showed that positive association between the system quality and the user satisfaction. These data are in consistent with the finding of the current study. Several other studies produced the similar finding as reported by the current study (Hosnavi and Ramezan, 2010; Halawi et al., 2007; Lederqc, 2007; Sheepers et al., 2006).

However, some studies have not supported the outcome of this study concerning the positive relationship between system quality and HRIS. Kelin (2007) conducted an examination of patient-physician portal acceptance and reported that system quality did not significantly influence HRIS use in a hospital setting. Similarly, McGill et al. (2003) and Wang and Liao (2008) produced outcomes contrary to the findings of this study by showing that system quality was irrelevant to IS users. These differences in the findings between this study and other studies may be related to the different cultures and different type of organisations involved in the research (Wang & Liao 2008, Gorla et al. 2010), or the different analytical tools used for data analysis may have yielded contrary results (Petter et al. 2009).

Moreover, variations between the results of this study and those of others might be due to the fact that the users involved in other studies might have been more self-efficient

and experienced in HRIS applications compared to those participating in this study, and ease of use or system quality might not be critical factors for more experienced users and may not matter much to them. These data also suggest that system quality is very important to HRIS users in the HR Departments of the KSA. The management of HRIS quality should be done through the continuous attention of authorities and investments in this regard.

Nevertheless, some studies have revealed a marginal effect of system quality on HRIS use among HR executives, who mostly rely on a pen and paper method of management and who adopt a hardcopy documentation approach towards evaluating employees (Shani and Tesone, 2010). “The use of HRIS has a significant impact on the current affairs between the management and the employees, as well as the characteristics and the environments of the temporary workplace” (Shana and Tesone 2010: 43). Partly, this is because of the access that employees and managers have to information relating to a company’s rules and regulations. Similarly, Hill et al. (2010) state that system quality is essentially a prerequisite for promoting HRIS use due to the ease of using multiple functions, such as tracking employee information regarding payroll, professional development, employee demographics and qualifications, recruitment, performance evaluation, attrition and retention.

In conclusion, the implication of these findings for the leadership of Saudi public universities is that they cannot increase user satisfaction and HRIS use without maintaining system quality. Based on these data, management is required to check system quality regularly. In some universities, they have legacy HRIS systems; the leadership should invest more to upgrade the HRIS system to enhance system quality, which will ensure greater use of HRIS in those schools.

#### ***6.1.2.4 The Impact of Information Quality on HRIS use and user satisfaction***

This study reveals that information quality, as with system quality, is a predictor of both HRIS use and user satisfaction. This outcome of the present study clearly demonstrates that the impact of information quality on user satisfaction and HRIS use were significant ( $p < 0.001$ ), as can be seen in Table 5.20.

Wang and Liao (2006) supported the finding of the current study by showing the information quality was significantly related to the HRIS use in the context of G2C e-government systems. Petter et al (2009) supported the our finding by providing



evidence regarding the significant association between HRIS use and the information quality. Similarly, Halawi et al (2007) and Kositanurit et al (2006) supported the strong association between the HRIS use and information quality as showed by the current study. In addition, Al-Khowaiter et al (2013), Wang and Liao (2008) and Al-Shibly (2014) explained that the total effects of information quality on use, user satisfaction and perceived HRIS adoption are substantially greater than those of system quality and service quality, which is in agreement with the finding obtained from the present study. This finding also supports the results derived from the qualitative interviews presented earlier (in section 3.1.1), where it was shown that user satisfaction is related to information quality. The users were not pleased with the information quality, which was considered to be a great obstacle to the successful use of HRIS in the HR Departments of the universities that participated in this study. This indicates that to promote greater use of HRIS, the authorities in the public universities of the KSA need to pay more attention to enhancing IS applications.

The results of this study showed a high degree of association between user satisfaction and information quality. Several studies have supported the finding that information quality is a critical factor in terms of its role in fostering successful HRIS use (Chie et al. 2007, Halawi et al. 2007, Kulkarni et al. 2006, Wu and Wang 2006). Hosnavi and Ramezan (2010) conducted the empirical study in an Iranian Oil company to investigate the effectiveness of HRIS in the HR department of the company. The outcomes of their study indicated a strong association between the information quality and user satisfaction as presented in Delone and McLean IS success model. Hussain et al (2007) reported that user satisfaction with HRIS is enhanced through increasing the information quality in both medium and large sized organizations. This study also showed the strong correlation between information quality and HRIS use. Consequently, above studies supported the findings of this study which has been conducted in large sized organizations such as public universities of Saudi Arabia. The greater the information quality, the greater the HRIS use. This finding was supported by previous researches (Kositanurit et al. 2006, Iivari 2005, Wixom & Todd 2005) that demonstrated a strong association between information quality and HRIS use. Al-khowaiter et al (2013) also showed the correlation between the information quality dimension and the satisfaction of the users in the large organization settings. Shepers et al (2004) provided empirical evidence regarding the determinants of mobile

computing system success, and discovered that high quality data, data retrieval and data processing of HRIS were the main determinants which led to the higher user satisfaction. Petter et al (2009), and Alshibly (2014) validated and implemented the Delone and McLean model and revealed that strong association between the information quality and the users satisfaction. These studies corroborate the finding of this study. Therefore, this study, along with other studies, asserts the need to furnish high-quality information system (e.g. HRIS) within HR Departments of Saudi public universities to enhance user satisfaction and provide a greater level of HRIS use for better quality decision making.

Of particular note is the fact that the provision of an excessive load of information to users results in the dissipation of information, which decreases the overall utility of information in the decision-making process. Therefore, information managed through HRIS should be sufficient enough to enable the user to make quality decisions. Appropriate measures and care should be taken to prevent the overflow of information, which is likely to decrease the quality of decisions due to information overload (Al-Shibly 2011, Rai et al. 2002).

Furthermore, HRIS users may be affected by the extent to which a particular piece of information is accurate, and the extent to which the specific information meets the user's requirements in terms of executing the routine tasks within organisations. This study reveals that the information quality dimension makes the HRIS more valuable and useful to HR employees by allowing them to have up-to-date, accurate, detailed and complete information. Therefore, the provision of high-quality information to users can enhance their capability to make quick and qualitative decisions to achieve organisational objectives.

In addition, information quality is also related to the level of understandability of the information provided by HRIS to the users. For instance, if information provided by HRIS is easy to understand and applicable to the relevant tasks, then it creates a sense of satisfaction among the users (Rai et al. 2002). The suggestions provided by Rai and his colleagues give a great impetus to the use of HRIS by increasing the information quality in Saudi public universities. Consequently, HR Departments can be motivated to use HRIS to a greater extent by enhancing the information quality. In other words, the greater the level of use of HRIS, the greater will be the focus on the need for

improving information quality on behalf of the concerned authorities in the public universities of the KSA. The opinions and experiences of the participants who took part in the qualitative Phase I expressed a similar recommendation for the authorities.

However, some studies have reported findings quite opposite to those of this study. McGill et al. (2003) showed that there is a weak association between information quality and HRIS use. Iivari (2005) showed similar results to those of McGill and his colleagues pertaining to the association between information quality and user satisfaction. Marble (2003) reported that there is a marginal link between information quality and user satisfaction. The variations in the findings of this study from those of other studies may be as a result of the data analysis techniques or the availability of highly refined information to HRIS users in the other studies. Therefore, those studies did not report a clear-cut link between user satisfaction, HRIS use and information quality.

Given the context of Saudi public universities, the leadership can take appropriate measures to ensure information quality by introducing data scanning packages for the detection of any gaps in the data, initiating appraisals of data quality to detect anomalies, and establishing measures to correct potential errors in the data.

To conclude, the findings of this study show that information quality is an important indicator of user satisfaction and the use of HRIS. This reflects the fact that information quality increases the HRIS adoption in terms of increasing HRIS productivity, efficiency and performance for the Saudi public universities. It does this through the mechanisms of increasing the use of HRIS and user satisfaction with HRIS within Saudi universities.

#### ***6.1.2.5 The Impact of Service Quality on HRIS Use and user satisfaction***

It was hypothesised that service quality has a positive influence on HRIS use and user satisfaction. This study supported the hypothesis that service quality is positively correlated with user satisfaction ( $B = 0.209$ ). However, the hypothesis concerning the positive link between service quality and HRIS use was rejected ( $p > 0.05$ ). The results relating to this dimension can be viewed in Table 5.20. The interesting finding showed by the current study is that there is no significant relationship between the service quality and the HRIS use, which is consistent with the results reported by Petter et al (2009). They performed met-analysis of 26 studies, and showed that none of them

supported the positive association between the HRIS use and the service quality. Similarly, the outcomes demonstrated by the studies of Halawi et al (2007) and Kositanurit et al (2006), showing that there is no significant relationship between the service quality and the HRIS use.

Unlike the finding of this study, a strong correlation between HRIS use and service quality was reported by several other studies (Al-khuwaiter et al., 2013; Fitzgerald and Russo, 2005; Calderi and Ward, 2002, Al-Shibly 2014), while it was marginally supported by that of Wang and Liao (2008). Similarly, the service quality was shown to be significantly associated with the HRIS use by the study of Wang and Liao (2006). This is not consistent with the findings reported by our study, which might be due to difference between any two organizations operating under the different socio-cultural and organizational parameters. This may be associated with different level of user's training, education and experience with HRIS, which either weaken or strengthen the association between the service quality and the use of HRIS.

In agreement with the finding of our study, Kositanurit et al. (2006) demonstrated no link between HRIS use and service quality. Similarly, the positive relationship between service quality and user satisfaction, as found by this study, is supported by several other studies (Halawi et al. 2007, Shaw et al. 2002, Al-Shibly 2014, Wang and Liao 2008, Leclercq 2007), indicating the strength of the findings of this study.

However, some studies reported different results compared to those shown by this study (Chui et al. 2007, Marble 2003, Aladwani 2002, Palmer 2002). After careful study of the literature, these variations can be ascribed to differences in the sectors of HRIS implementation or to different IS applications being tested for use, as the current study has focused only on those applications that are routinely used within HR Departments of public universities in the KSA. Most of the studies conducted in this context corroborated the outcome of the present study.

However, service quality affected user satisfaction significantly in this study, showing that timeliness and completeness are major factors that affect user satisfaction (Anitha and Aruna 2014). In the qualitative phase of this study, it was shown that the users (participants) were concerned about the timeliness, completeness and accuracy of the services provided by HRIS applications within HR Departments in public universities. Based on these concerns, the findings from both the quantitative and qualitative phases

of this study carry a great significance for HR managers in Saudi universities by urging the streamlining of HRIS functions. This will ensure better quality services to HRIS users within HR Departments in accordance with user requirements, thereby enhancing user satisfaction.

Interestingly, our study found a positive relationship between user satisfaction and service quality, indicating that if service quality is provided to the high level satisfaction of users, then HRIS use should increase accordingly. It indicates that service quality, indirectly promotes HRIS use by enhancing user satisfaction. Brown (2013) reported that the service quality of the HRIS is related to the efficiency of the system. The higher the service quality, the higher the efficiency of the system, which brings about user satisfaction. Ultimately, a higher level of user satisfaction results in a greater level of HRIS use. These findings have been supported by Al-khowaiter et al (2013) which showed that users satisfaction can be increased by increasing the service quality to the users, which stands in line with the outcome of the current study. Another study conducted by Shaw et al (2002) measured IS success and validated the Delone and McLean IS success model in high-tech organization. They reported the service quality significantly affected the user satisfaction, thereby agreeing with the findings revealed by the current study. Likewise, Halwai et al (2007) and Lederq (2007) revealed the determinants of knowledge management system success and IS in French group, respectively, and found that the service quality is a critical dimension for enhancing the user satisfaction of HRIS in HR departments of organizations. Some other studies showed the strong correlation between service quality and user satisfaction (Al-khowaiter et al., 2013; Alshibli, 2014) . Thus the results of the current study are supported by other studies conducted in both public and private sectors. However, some studies not did support the finding that there is a significant relationship between the service quality and the users satisfaction (Petter et al., 2009; Alshibly, 2014). This difference might be associated with the highly qualified partners and service providers to satisfy the needs of HRIS users available in the developed countries, but not in developing countries like Saudi Arabia.

The results of this study have far-reaching implications for the HR managers working to implement HRIS to establish better strategic decision making and to enhance the effectiveness of HR operations within their organisations. Furthermore, reliability, information validity and utility are key service features that are considered to be

essential for improving service quality. The focus of any quality-oriented HRIS should be placed on increasing the presence of these features within HRIS. As stated by Kovach and Cathcath (1999: 281), “The most important elements of an HRIS are not the computers, but the information. The focus of any comprehensive HRIS should be on information validity, reliability and utility first and on automation of the process second”. Therefore, the HR managers of the public universities in Saudi Arabia should apply stringent tests to check the utility, reliability and validity of HRIS information to improve service quality.

Furthermore, Targowski and Deshpande (2001) are of the view that companies that work with better IS service quality are in a more advantageous position compared to those that do not. Similarly, HRIS designed to provide better service quality for the users helps to achieve a competitive advantage for companies in the marketplace, as well as more satisfied stakeholders. Therefore, one can argue that service quality is essential for user satisfaction and subsequently increases HRIS use within the HR Departments of public universities in the KSA. This can help organisations to gain a competitive advantage in the local and international education markets. This conclusion is supported by Ngai and Wat (2006), who revealed that 60 per cent of companies fulfil the parameter of high service quality for enhancing HRIS use and improving the decision-making process.

The bottom line is that service quality is an important mediator for enhancing the HRIS adoption for the public universities of Saudi Arabia by increasing the use of HRIS and user satisfaction. This means that the net productivity, efficiency and performance of the HR Departments within Saudi public universities can be enhanced by increasing the service quality of the system. In addition, service quality can be enhanced by increasing the reliability, validity and robustness of the information provided by HRIS to the users.

#### ***6.1.2.6 The Impact of HRIS Use and User Satisfaction***

As expected, user satisfaction had a significant influence on HRIS use in this study, and HRIS use influenced user satisfaction as well. Thus, H2 was supported ( $p < 0.05$ ). These results can be viewed in Table 5.28. This clearly indicates that increased user satisfaction brings about increased HRIS use and vice versa. HRIS use and user satisfaction are considered to be valuable proxy measures for discerning HRIS success (Al-Shibly 2014, Bailey and Pearson 1983, Doll and Torkzadeh 1998). This means that

increased user satisfaction leads to a higher level of use of the system. A high level of HRIS use correlates with greater effectiveness of the system. Therefore, this study suggests that system usage and user satisfaction are invariably related to each other, and that users' satisfaction is linked to the effectiveness of the HRIS for the HR Departments of public universities in Saudi Arabia. This was achieved in this research by measuring and analysing the respondents' feedback, for example the participants perceived HRIS use as important because they have used it satisfactorily. Thus, since the result is positive, the system quality, service quality and information quality will influence users' satisfaction. This will motivate HR employees to use the HRIS system efficiently and effectively, which will improve productivity, performance, and decision making, and decrease the time taken to complete tasks in public universities (HR Departments).

The HRM managers can employ the HRIS in order to achieve higher performance and better productivity for the public universities. Furthermore, this also confirms that user satisfaction and HRIS usage are complementary to each other, while retaining their status as distinct variables for the achievement of HRIS adoptions for organisations. Importantly, the reversible relationship between use and user satisfaction was not shown by any other study, as far as the researcher knows. Most of the studies reported on the relationships between HRIS use and user satisfaction or the user satisfaction relationship with HRIS use individually. The current study showed that user satisfaction exerts a significant impact on HRIS use, and that is supported by several other studies (Chui et al. 2007, Halawi et al. 2007, Bharati and Chaudhary 2006). Furthermore, this relationship is supported by Iivari (2005) and Wixom and Todd (2005), whereas the studies that reported different results include Vlahs et al. (2004) and Ang and Soh (1997), who describe a weak link between use and user satisfaction.

It can be noted that the studies reporting a non-significant relationship between user satisfaction and HRIS use were carried out in mandatory settings. However, in voluntary and mandatory settings where rewards are used as motivators, user satisfaction leads to enhanced usage of HRIS (Kim et al. 2002, Rai et al. 2002). Similarly, studies which corroborated the finding of this study relating to the significant relationship between HRIS use and user satisfaction include Chuai et al. (2007), Halawi et al. (2007), Iivari (2005), Al-Shibly (2014), and Wang and Liao (2008). Importantly, Davarpanah and Mohamed (2013) supported that if users are satisfied with the data

handling applications such as data collection and monitoring, record keeping and payroll systems and other HRIS applications such as training software packages and performance management, it impacts the use of HRIS in the public sector organization. They specifically showed that the user satisfaction constitutes the important pillar of the success and use of the HRIS within the organizational settings. These data corroborate the findings of our study that user satisfaction increases the use of HRIS in Saudi public universities. Another study reporting the influence of management participation on adoption of HRIS in teachers service commission operations in Kenya suggested that users satisfaction was a dimension in facilitating the enhanced use of HRIS within the organization (Warui et al., 2015). Some other studies found a correlation between the human resource management professionals' satisfaction with the information and system coordinates of HRIS with the use of HRIS applications in the service oriented organizations (Hussain et al., 2007; Petter et al., 2009; Al-khowaiter et al., 2013). The implication of these findings is that HRIS use and satisfaction of users with different aspects of the HRIS affect each other interchangeably. This means that without user satisfaction, the higher level of the use of HRIS can not be achieved and vice versa.

However, this finding was not supported by a study carried out by Seddon and Kiew in the Australian context. The difference may have arisen because they used a partial test to validate the DeLone and McLean model, which is likely to have affected the outcome of the relationship. Moreover, participants in the qualitative phase of the study also commented on the relationship between user satisfaction and HRIS use. According to Pick (2008) and David and Jackson (2005), if there is a more obvious relationship between user satisfaction and the usage of a system, additional increased benefits of the HRIS applications can be observed in the form of increased performance and productivity.

Given the influence of user satisfaction and HRIS use, both constructs exert positive influence on the organisation HRIS adoption ( $B=0.450$ ), ( $B=0.482$ ), this result can be found in Table (5.24) in chapter 5, which is compatible with the results reported by Iivari (2005) and DeLone and McLean (2003). Petter et al (2009) found that by improving the user satisfaction through provision of good service quality, system quality, and information quality, the productivity and high performance of HR functionalities can be achieved. Consequently, they implied that higher level of user



satisfaction led to the increased HRIS use and adoption for the organization. Law and Ngai (2007) have empirically demonstrated by using the Delone and McLean IS success model that user satisfaction influenced positively the HRIS use and adoption for the organization. Some other studies have highlighted the strong relationship between the user satisfaction and organizational adoption usage, which means that organization can only achieve the high performance and productivity through increasing the user satisfaction (Rai et al., 2002; McGill and Klobas, 2005; Halawi et al., 2007; Al-khowaiter et al., 2013). Similarly, Alshibly (2014) is of the view that organizational performance and achievement of business goals is not possible without obtaining the users' satisfaction with HRIS applications.

This study shows the strong association between the use and adoption usage of HRIS. Lederer (2007) validated the Delone and McLean IS success model in the organizational setting and showed that user satisfaction with the customised features of web-portals lead to higher use, and in turn the high use generated the greater productivity and organizational HRIS adoption for the organization introducing the web-portal. Zhu and Kraemer (2005) determined the factors affecting the successful adoption of HRIS, and found that the strong association between the use and organizational benefit was the main driving force behind the implementation and validation of the HRIS in the context of Aqaba Special Economic Zone Authority. Devaraj and Kohli (2003) and Hosnavi and Ramezan (2010) showed the similar findings agreeing with the outcomes of Zhu and Kraemer. Many other studies have demonstrated that there is a positive relationship between use and adoption usage of HRIS (Halawi et al., 2007; Burton-Jones and Straub, 2006; Rai et al., 2002; Al-khowaiter et al., 2013). These studies are consistent with the finding reported by this study.

Although, the continues HRIS system usage have positive impact on the organisation and it will enable the organisation to achieve its goals effectively and efficiently such as improve in employee selection process, better decision making process, better future planning, better management of training and development performance, improve work scheduling, better salary planning and help to establish easy communication among the universities department, yet, any glitch on the HRIS will affect the effectiveness and the efficiency of the organisation activities such as longer time required to carry a task, poor decision making process etc, based on this study results as presented in chapter 5.

However, it is necessary for the management of the public universities to ensure that cautions are applied in adopting and making use of the HRIS system for better output.

In addition, in the literature review, DeLone and McLean (2003) discussed the fact that the influence of these constructs on organisation impact is pronounced in most cases where system usage is typically mandatory. Iivari (2005) supported the stance held by DeLone and McLean by saying that the mandatory nature of a system can create a positive relationship between use and organisational impact. We categorise HRIS use as mandatory within the environment of the HR Departments of the public universities in the KSA, where users have less choice about HRIS usage. They are compelled to use it by the managers who know the real impact and utility of HRIS.

According to Johnson and Guental (2012), the success of HRIS, in terms of greater usage and effectiveness, is related to user satisfaction, while the latter depends on the level of knowledge, training, skills and experience of the HR employees. In larger organisations, such as universities, HR employees tend to direct their focus on more complex issues, policies and HR decisions that have financial implications for the organisation. Without proper HRIS training and knowledge, an organisation cannot achieve the objectives of high performance and productivity due to dissatisfaction among employees. In the qualitative phase, it was observed that some of the respondents did not show satisfaction with the existing HRIS due to the lack of training and knowledge delivered to them by the universities' HR Departments.

Based on this finding, it can be argued that the lack of attention to either HRIS use or user satisfaction can cause disastrous consequences for the performance of HR Departments in Saudi public universities. Furthermore, the strong positive correlation between user satisfaction and organisational impact mandates that concerned HR managers in the public universities of the KSA should increase the user satisfaction dimension by providing training and knowledge about the impact of HRIS. Consequently, this could increase the system usage within the HR Departments of the concerned universities.

Taken together, both system usage and user satisfaction can result in enhancing the organisational impact for public universities in the KSA. The managers are required to increase the use and user satisfaction constructs simultaneously; this will in turn

increase the HRIS adoption in terms of increasing productivity, efficiency and performance of HR Departments within Saudi universities

## **6.2 CONCLUSION OF DISCUSSION CHAPTER**

This chapter discussed the findings that were presented in Chapters 4 and 5. It shows that most of the hypotheses presented were supported by the analysis of the data presented. Some of the hypotheses were supported by the findings in the first and second phase of the data collection, such as HRIS use and user satisfaction. So the research model developed for the study was examined carefully, and suggestions were made based on the discovery that the subjective norm affects the level of HRIS use in this study. Therefore modifying the model to fit a multicultural context is essential because of the discovery, based on different cultures and principles.

Therefore, the next chapter will conclude the whole work, thus presenting the practical contribution, the research theoretical framework, the limitations of the study and recommendations for future work.

## 7.0 CONCLUSION CHAPTER

### 7.1 INTRODUCTION

This chapter describes the output of the research by discussing the research contribution, limitations of the research, and future work. Firstly, it discusses the contribution of the study, both the theoretical and practical contributions. Secondly, it discusses the limitations of the research, and thirdly, it discusses the direction of any future work.

### 7.2 Contribution of the Study

#### 7.2.1 Contribution to conceptual framework of HRIS

##### Development of the HRIS success model

Based on the outcomes obtained from the quantitative phase of this study, the following model has been constructed. It elucidates the relationships, with their strengths, that contribute to the organisational HRIS adoption. The model is shown in Figure 7.1.

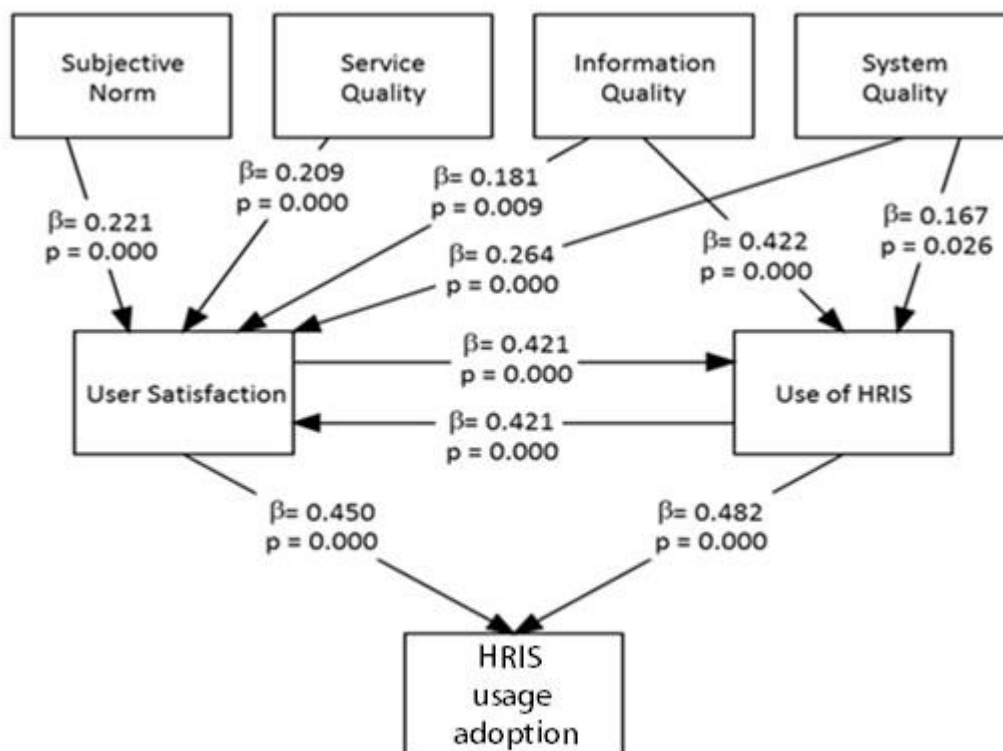


Figure 7.1. Final Conceptual Framework (HRIS) Model

The hypothesis model shown in the above figure presents the properties of causal relationships between the independent and dependent variables, such as p-values,

standardised coefficients and variances. The model developed in this thesis is the updated version of the DeLone and McLean model (2003). In contrast to the DeLone and McLean model (2003), the salient feature of this hypothesised model is the inclusion of subjective norm, which positively impacts user satisfaction and is an indirect predictor of HRIS use via the user satisfaction dimension in the context of Saudi public universities.

The model portrays the strengths of the impact of various variables or independent variables, such as the subjective norm, service quality, information quality and system quality, on the intermediary dependent variables: user satisfaction and HRIS use. The subjective norm has a stronger relationship ( $B = 0.221$ ) with the user satisfaction dimension compared to other dimensions, such as service quality ( $B = 0.209$ ) and information quality ( $B = 0.181$ ). System quality shows the strongest relationship ( $B = 0.167$ ) of all the independent variables; this clearly indicates that system quality needs to be enhanced, along with consideration of subjective norm, to achieve a higher level of user satisfaction. Ultimately, a higher user satisfaction will guarantee a higher level of HRIS use within the HR Departments of Saudi public universities, thereby generating a higher level of organisational impact. In the hypothesised model, only two constructs – information quality and system quality – significantly affect and hold a strong relationship with HRIS use. As far as the strength of the relationship between information quality and system quality is concerned, information quality holds a stronger relationship ( $B = 0.422$ ) with HRIS use than system quality, indicating that HR managers of public universities in the KSA need to improve information quality to increase HRIS use and to consequently improve organisational impact.

The overarching unique contribution that this study makes is the additional dimension – subjective norm – added to the DeLone and McLean (2003) IS Success Model.

Furthermore, this study conducts an analysis of the *adoption* and *use* of HRIS in the specific context of *public universities* in Saudi Arabia. This is unique in its own right relative to other studies that analyse the DeLone and McLean (2003) IS Success Model. The Al-Khuwaiter et al. (2014) study for example incorporates the D&M Model, but it does not focus on a specific type of organisation such as universities; rather it is based on public sector organisations in general in Saudi Arabia.

In addition, this study investigated the *adoption, use and success* of the HRIS within *Human Resource departments* of Saudi Arabian public *universities* by developing a new HRIS model. The Al-Khuwaiter et al. (2014) study combined existing models to examine the *factors* influencing the use and adoption of HRIS in different organisations. To read more about the differences between this study and Al-Khuwaiter et al.'s (2014) study, the literature review section 2.9 can be consulted.

With this study's targeted focus on HR departments within universities, universities will be able to attain more value from this study relative to others, as it is unique to their context and sensitive to the environment in which they operate.

A further unique contribution that this study offers is that it is based on mixed-method techniques for data gathering, analysis and deduction. The first phase of data gathering consisted of qualitative data collection, based largely on interviews that were used to create the initial adapted model, incorporating 'Subjective Norms'. This was subsequently followed by phase II – quantitative analysis to gather primary research data on the response to the adapted framework. This subsequent phase was utilised to further refine the model to ensure that it was suitable for use within the context in which it would be used. This approach to the analysis of the model, inclusive of the additional dimension added to the model, has never been conducted before. This study made the first effort to utilise mixed methods for primary data collection for analysis and to respond to the adapted model. This resulted in a more robust and comprehensive model, meeting the exact and specific requirements of the users within the context of the HR departments in universities. To the best of the researcher's knowledge, there is no other study that offers adapted models based on mixed method research gathering techniques. The overarching unique contribution that this study offers is the unique dimension added to the D&M IS Success Model. The dimension 'Subject Norm' is an internal factor influencing the adoption and use of HRIS. There are other studies that incorporate other factors such as social influences, however these studies vary from this study's findings; further information can be found in Chapter 2, section 2.8. Further studies by Al-Hudhaif (2010), Alshibly (2014), and Davarpanah and Mohamed (2013) were considered as part of this study, however they work towards achieving different objectives, utilising different techniques based on different contexts.

In conclusion, the overall unique contributions that this study offers is that it is (1) presented on the basis of mixed-method data gathering techniques that have enabled the incorporation of a unique dimension that is based on the data gathered, thus ensuring

its robustness and comprehensiveness; (2) this study is specifically targeted at public university HR departments; and (3) it offers a new dimension specifically to the D&M IS success model which is a direct extension of the model. There are no other studies that make this unique contribution to the discourse of the success of HRIS in public universities.

### **7.2.2 Practical Contribution**

The findings from this research offer a number of practical applications for Saudi public universities and for the government of Saudi Arabia to improve HRIS use and organisational performance effectively and efficiently.

1. This research incorporated a very important construct – that of subjective norms – into the existing model of DeLone and McLean. This is the novel development introduced in this study that explores the relationship between the use of HRIS and subjective norm. This study found that the subjective norm dimension plays a critical role in fostering the use of HRIS due to the strong influence of social members on each other. Due to various cultures (including the Middle Eastern countries) this study developed a novel multidimensional model of HRIS incorporating a new construct (subjective norm), which can be applied to Arab societies to increase the use of HRIS within universities. Consequently, it is recommended that the subjective norm be incorporated into Saudi public universities to successfully adopt HRIS in their HR departments. The recommendations and suggestions of senior HR leadership should be taken into consideration when approving the use of HRIS, by linking it to performance and HR functions. This will also help the organisation to adopt and use HRIS effectively by understanding employees' perception of HRIS. This will ultimately result in increasing the use of HRIS.
2. This research reported that the use of HRIS increases organisational effectiveness in public universities of Saudi Arabia, which was evident from the phase I and phase II findings of this research. The study showed that stakeholders are not fully aware of the significance of HRIS to their organisation. There is a need for stakeholders of universities to consider creating an awareness of the importance of HRIS, focussed on an analytical approach to optimise the use of HRIS in their organisation. This is an important growth and development area of



HR and IS. The focus on use and user satisfaction will facilitate the formulation of appropriate policies and the building of a better organisational culture. This will optimise the benefits associated with the use of HRIS, which will in turn improve the existing use of HRIS in public universities in particular and in Saudi Arabia as a whole.

3. Training on the adoption and use of HRIS should be provided to the HRIS users, as the outcomes of the phase I of this study indicated that users reported a lack of adequate level of training, which could have a negative impact on the use and success of the HRIS. Thus it may affect the efficiency and effectiveness of service delivery and impact negatively on organisational objectives. Khairnar (2015) supported this recommendation by reporting that training was found to be an integral part of the successful implementation of HRIS in Indian organisations.
4. The successful implementation of HRIS also depends on improved communication between various departments of the organisation. The phase I findings of this study reported that only HR departments of universities make use of HRIS and these are not linked to other departments. This means that there are unclear communication procedures and channels across various departments of the universities. Therefore, this study recommends that the roles of different departments be analysed, and that a robust HRIS be implemented in order to link the services of HRIS to other university departments. This will improve communication between systems and between personnel, increasing the level of success of HRIS within public universities.
5. The study suggests that the problem of poor service quality is due to time delays with fixing any faults in the HRIS, caused by the lack of in-house support teams for the maintenance of the HRIS. This could be improved in order to increase the efficiency of HRIS functions within an organisation. The outcomes from phase II of this study revealed the positive impact on service quality, user satisfaction and HRIS adoption of having a support team within the organisation, rather than having an external support team that usually takes longer to respond to any request. Therefore, the HR managers of Saudi public universities should focus on the improvement of service quality and efficiency by having a support

team within the organisation. Several other researchers have supported the recommendation offered by this study (Bondarouk and Ruel, 2006; Hendrickson, 2003).

6. This study shows that system quality has a significant impact on the use of HRIS within HR departments of public universities in Saudi Arabia. Thus, the effectiveness and efficiency of the system improve the optimisation of HRIS within the organisation. This means that HR leadership should take appropriate measures to improve the system quality by formulating and monitoring a maintenance team. For instance, HR departments of Saudi public universities have to pay special attention to establishing specialised IT teams that would be ready to deal with any malfunctions that occur on a continuous basis. This aspect is currently lacking in Saudi Arabian public universities.
7. The data from this research has shown that one of the major reasons why organisations act reluctantly to implement HRIS is that they are not fully convinced of its practical benefits, or that there is insufficient capital to deploy it due to the cost associated with the adoption and use of HRIS. There is a need to provide a clear analytical report explaining why HRIS adoption is required, along with the benefits associated with its usage. This will create an awareness of how easy and convenient it is to use, how it helps to process information faster, and how it can help to provide suggestions for decision making. Also, on the issue of insufficient capital to deploy HRIS systems, there is a need to provide low budget costs and seek external support from the governing body.
8. Again, part of the challenge for Saudi public universities is the uneven implementation of HRIS applications across different departments of the same universities. Some departments adopted HRIS technology earlier, while some are lagging behind. This creates the problem of unparallel system performance and further undermines the efforts aimed at increasing the widespread use of HRIS in Saudi public universities. Therefore, the leadership of Saudi public universities need to take solid steps to deploy HRIS across all departments if they are really interested in increasing the success and use of HRIS. They should, furthermore, display a widespread, organisation-wide and consistent commitment to enhancing the use of HRIS applications. Formulating a

mandatory policy for all university departments to encourage the use of HRIS applications can do this.

9. The important finding of this study in phase I was that earlier adapters have more experience of handling the issues that can arise from using HRIS. Thus this study recommends that the advice and recommendations of earlier adapters should be shared among colleagues at workplaces through organisation improvement meetings. This process will improve the functional and operational efficiency of HRIS in public universities. This will improve the overall use of HRIS programmes within Saudi public universities, and improve organisational culture.
10. The findings of this research also suggest that university leaders need to make use of the funding dedicated to HRIS for improving the quality of the information, systems and services. The quality-related dimensions should be improved by taking into consideration the feedback of users, HRIS performance evaluations and examinations of the acceptance levels of HRIS users. Therefore, this study emphasises that the HR leadership of universities should provide quick access to higher quality and more substantial HR data and related reports, in order to increase the use of HRIS in HR Departments.
11. Currently, despite the applications of HRIS across well-established universities in the KSA, public universities in Saudi Arabia lack a competitive advantage over their private counterparts in terms of attracting professional employees of high calibre. It is reported that streamlining the functions of HRM could not only retain employees but also attract people with great potential and talent (Ulrich, 2013). This study provides a comprehensive model that provides guidelines for streamlining HRM functions by increasing the use of HRIS applications. The increase in use and user satisfaction (the dependent variables of the study) promises to increase the HRIS adoptions in the form of increased competitive advantage, better services and care for the members of Saudi universities.
12. This study also validated the English version of the questionnaire in the Arab region. It was found to be reliable and can be further applied to conduct research in the area of information system use in general, and HRIS in particular. Thus,

future studies should use this validated version of the questionnaire for conducting studies in other public organisations in Saudi Arabia.

13. In this study, it was found that lack of customised features in the use of HRIS affects the efficiency of the HRIS, since the HRIS is built to fit every organisation. There are therefore many redundant features that could affect the ease of use of the system, or the time required to process information. There are features included that are not needed for a particular department or function. Therefore, this study recommends the use of customised HRIS for effective and efficient use of the HRIS. This will help to reassure the users that the HRIS is designed to fit their job functions and roles in an effective and efficient way, and will optimise the HRIS adoption associated with it.
14. The findings of this study demonstrate that information quality, system quality, service quality, subjective norms, use, user satisfaction and perceived organisational HRIS adoption are valid measures to measure the use and adoption of HRIS in the HR departments of Saudi public universities. On this basis, it is confirmed that this model is an effective framework for the successful use and adoption of HRIS.

### **7.2.3 Contribution to methodology**

The main methodological contribution of this research was the use of the mixed-method approach (qualitative and quantitative methods) to explore the impact of HRIS on HRM in the public universities in Saudi Arabia. As explained in Chapters 2 and 3, the majority of HRIS studies have used only one method. Some researchers have used the qualitative method. For instance, Ivori (2005), Wng et al. 2008, Ramezan 2011, Gorla et al. 2010 and Urbach (2010) employed the qualitative research method to evaluate the HRIS success model proposed by DeLone and McLean. Other studies have used the quantitative method, such as D&M (1992, 2003) in addition to Petter, D&M (2009). This clearly shows that there is no single appropriate approach with which to build and validate the proposed model of HRIS use within organisations.

Also, the data collected in the previous studies were mainly from the service industries, banking sectors, and marketing and private sectors in general, while the data collected in the current study were from HR Department employees and staff from Saudi public universities. Applying such a mixed-method approach in this study on the impact of HRIS on HR Departments in the public sector, in a developing Middle Eastern country, was challenging due to the regulations restricting public universities and difficulties with accessing the data.

### **7.3 Study Limitations**

It is important to note that the process of investigation and research in any field is likely to involve some limitations and implications, and this research is not an exception. Some of the limitations associated with this research include the following:

*The study is limited* to the HR Departments at public universities in Saudi Arabian

*Gender sensitivity and inequality.* This research was carried out in an environment where there is a high sensitivity about female interaction and involvement in general day-to-day activities. In universities for only female students, women must fill all of the staff positions, from clerks to the vice-chancellor of the university. Due to social separation between males and females in Saudi culture, both genders perceive their physical world in different ways. In Saudi Arabia, the education for females is delivered in a completely separate and independent environment. This research was carried out only for male Saudi public universities. The outcomes relating to the use of HRIS and models for use in the HR Departments of female Saudi universities may show some different inter-relationships in terms of the dimensions researched in this study. Therefore, care should be taken when applying the outcomes of this research to the HR Departments of female Saudi public universities.

*Population.* The research was conducted only within public universities in Saudi Arabia. There are a total of 32 public universities, which are divided into five regions of Saudi Arabia. From each region, only a single university was selected and included in the sample population. Thus, each university represents its region. However, in each region, some universities are newly established and some are old. Moreover, private universities that have different infrastructures, policies and HRIS applications are not included in this research. Therefore, care must be taken in

generalising the findings of this study to Saudi private universities, including the later adapters of HRIS and the new Saudi public universities in different regions of the country.

***Participation.*** Ten HR participants were selected for this study. They are considered to be experts and professionals in the HR Departments of their respective universities. However, the variety of opinions and experiences could have been yielded somewhat differently with the inclusion of HR managers from different universities. Thus, HR professionals should apply knowledge from their own experiences in their respective universities.

***The validity of the study*** is based on the understanding, honesty and observations of the participants in the study. The study has highlighted some findings that have impacts on HRIS application and on HR Departments in the public universities in Saudi Arabia. The findings have succeeded in highlighting to some extent new findings in the area of HRIS use and adoption, such as the subjective norms effect as described in Chapter six. Also, the study has provided a better understanding and measure of HRIS and its impact on HRM practices in the public universities in Saudi Arabia, according to the nature of the basic construct of the model that is applied in this study. It is also significant to mention that the study recommended the integration of a new construct – subjective norm.

#### **7.4 Directions for Future Research**

**1.** This study was conducted in public universities in the KSA; therefore, it is recommended that subsequent research related to HRIS be conducted in private universities and different government institutions to gain a perspective on those institutions and to balance the limitations that exist. This recommendation is not limited to researchers; it is something that all institutions, including private and public organisations and small and multinational corporations, should embrace to help benefit from the fastest and safest approach to modern HRM. Information is vital, not only for human capital development, HRs and IS management, but also for the overall system of any organisation. In the universities and other institutions of higher learning, the overall budget for outdated HR systems can be cut down with a modern HRIS, which is faster, cheaper, and more efficient and effective in managing databases for staff and students.

2. This study sample included only males, according to the Saudi regulations, so I recommend that researchers should conduct a similar study on female universities, such as Norah University in Riyadh, the capital of Saudi Arabia. This research was carried out in male universities, not to discriminate against females or to keep them from participating, but to limit data collection and to allow future researchers to conduct more research on other universities, including Norah University.

3. Since this is the first study that includes the dimension of subjective norm and extends the DeLone and McLean model, we recommend that this dimension be investigated in further studies, especially its impact on usage and user satisfaction. In doing so, wider knowledge and a more argumentative perspective can be created for the model, the HRIS impact and user satisfaction.

4. Since this study was the first to use mixed methods in Saudi Arabia, further research should carry out research using a mixed method in other Middle East countries. Such research could also test the updated model from the findings of this research, with the addition of subjective norm to the DeLone and McLean model (2003). This is necessary to provide better understanding and effectiveness on how to widen the knowledge associated with this aspect of study.

5. In the findings of phase I, the different factors such as the high maintenance costs of HRIS, and the training needs of the users, were reported to affect the use and success of HRIS in Saudi public universities. However, this study was restricted to measuring the constructs and dimensions included in the proposed HRIS success model. Future research can target the research implications of phase I, and design the research to measure the impact of maintenance costs and training needs. For instance, the various training packages for HRIS users and their influence on the use of HRIS will reveal the impact of training on the satisfaction with HRIS in Saudi universities. In addition, the comparison between existing training needs and future training programmes will also generate useful data concerning the influence of training on users' needs. The cost of maintenance may be problematic for the newly established universities, as they may not have the required funding to support the HRIS installation and maintenance costs. It will be informative to gather some data about their level of funding, and issues faced by them in the training and maintenance of the users and systems. This will also provide them with prospects of support for launching HRIS packages in their HR departments.

6. The phase I findings of this study also found that the HRIS that is currently available to HR departments is not unified. The components of the system are dispersed within the organisation, and are not fully linked, causing disruption in the flow of communication. There is a need for further research on the unification of the HRIS system, through which the use of HRIS can be improved. Researchers undertaking future studies may consider building a communication model for the unification of the HRIS system within public universities. Such research endeavours may verify the findings of this research by supporting the hypothesis that unification of the HRIS within public organisations in Saudi Arabia can influence the use of HRIS and consequently increase the HRIS adoption for the organisation.



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## **Appendix (A)**

### **Participant's Information Leaflet**

**Title of study:** The Impact of Human Resources Information Systems on Human Resources Management Practices: Applied Study in Saudi Public Universities.

**Principal investigator:** Rashid G. Aletaibi

**Supervisor Professor:** J. Stewart

**Institute:** Department of Human Resource Department – Coventry University

#### **Introduction:**

I am a Doctoral researcher at Coventry University, and I am undertaking research into the application of Human Resource Information Systems within Saudi public universities. The study aims to find the extent to which the use of human resource information systems affects the functions of human resource management and aids staff performance, effectiveness and their job-related activities and duties. I would like to invite you to join this research study.

#### **Background information:**

The use of Human Resource Information Systems (HRIS) has been identified as an opportunity for human resource practitioners to become more strategic and perform their functions effectively and efficiently. The idea has been that HRIS allows the HR function to become more efficient and provides better information for decision making. The question that needs to be answered is: has HRIS fulfilled this task?

#### *Purpose of this research study*

Therefore, the purpose of this study is to identify specifically how HRIS can contribute to the effectiveness and strategic human resource management in Saudi Arabian public universities.

#### **Interview objectives:**

- To explore the most appropriate dimensions of HRIS in my study
- To identify any new factors that may affect the usage of HRIS in Saudi public universities.

#### *Procedures*

In this study, I will ask a few questions about how you use HRIS to perform human resource functions in your institution. This will take about one and half hours of your time. Your name and identity will not be collected, so your responses cannot be

associated with you. There is no risk involved in this study except your valuable time. There is no direct benefit to you also. However, the results of the study may help us to formulate guidelines and policies for the implementation of HRIS in Saudi public institutions and also for the teaching and training of HR academics and practitioners. Please be assured that information and data collected in this study will only be used for the purpose of academic exercise and that it might be the subject of publications in conferences and journals.

### **Right of refusal to participate and withdrawal**

You are free to choose to participate in the study. You may refuse to participate without any loss of benefit to which you are otherwise entitled to. You may also withdraw any time from the study without any adverse effect on yourself or your institution. You may also refuse to answer some or all the questions if you do not feel comfortable with any of the questions.

### ***Confidentiality***

The information provided by you will remain confidential. Nobody except the principal investigator will have access to it. Your name and identity will not be disclosed at any time. However the data may be seen by an ethical review committee and may be published in journals and elsewhere, without giving your name or disclosing your identity.

### **The challenges**

This interview might face unexpected challenges. Time management will be one of the main challenges and the way to address this issue would be to be highly disciplined with the allocation of time for the interview section and to not go beyond the stipulated time. Funding is another factor that needs to be addressed.

### ***Available Sources of Information***

If you have any further questions you may contact the Principal Investigator (Rashid G. Aletaibi), Faculty of Business, Environment and Society at University on following email: [aletaibr@uni.coventry.ac.uk](mailto:aletaibr@uni.coventry.ac.uk) and telephone number: 00447407042842

OR

**Supervisor Professor:** j.stewart@coventry.ac.uk Tel:004476888493

**Thank you very much**

**Rashid G Aletaibi**

## Appendix (B)

### RESEARCH CONSENT FORM

**Dear participant,**

Warm greetings from the researcher, Rashid G Aletaibi and the research enumerators. I am a PhD candidate at Coventry University. I am doing research entitled ‘The Impact of Human Resources Information Systems on Human Resources Management Practices: Applied Study in Saudi Public Universities’. The study aims to find out the extent to which the use of human resource information systems affects the functions of human resource management, and aids the staff with performing their job-related activities and duties more or less effectively. The survey uses a fixed-response format so that you will be able to complete it easily and quickly (in less than 20 minutes). Please keep in mind that there is no right or wrong answer; we simply seek your opinions based on your knowledge and experience of practice in your university.

As a participant in this survey you face no risks. Your name and identity information will not be collected, so your responses cannot be associated with you. Please be assured that data collected in this research will be solely used for academic purposes and that it might be the subject of publications in conferences and journals. You may also withdraw from this study at any time without having to give an explanation. Once you sign this consent form, you agree to take part in the research and that you understand the above terms. Should you require additional information or have any questions, kindly ask or contact me (the researcher) with the details listed below.

**Sincerely,**

**Researcher name:** Rashid G Aletaibi  
**Email:** aletaibr@uni.coventry.ac.uk  
**Supervisor name:** Professor Jim Stewart  
**Email:** J.stewart@coventry.ac.uk  
Researcher signatur

#### **Participant Information**

**Respondent Name:**  
**Signature:**  
**Date:**

## **Appendix(C)**

### **The interview Questions**

#### **The semi-structured interview questions**

**Q1.**Could you introduce yourself?

- Name:
- University:
- Position:

**Q2.**How long have you been doing this job?

**Q3.**Please tell me about your job.

**Q4.** What kinds of HRIS are used in your university?

**Q5.** What are the reasons for adopting HRIS?

**Q6.**Which factors enhanced the implementation of HRIS in your university?

**Q7.**Which factors have hindered your university in its adoption of HRIS?

**Q8.** What lessons did you learn (about the system and implementation) during the adoption of HRIS in your university?

**Q9.** Can you explain the implications and/or organisational changes arising from HRIS adoption in your university?

**Q10.** Are there any other issues concerning HRIS adoption that have not been covered in this interview and that you wish to bring to our attention?

**Title of study:** The Impact of Human Resources Information Systems on Human Resources Management Practices: Applied Study in Saudi Public Universities.

**Principal investigator:** Rashid G. Aletaibi

**Supervisor Professor:** J. Stewart

**Institute:** Human Resource Department- Coventry University

**Dear Participant,**

I am a PhD candidate at Coventry University. I am doing a research on The Impact of Human Resources Information Systems on Human Resources Management Practices: Applied Study in Saudi Public Universities. The study aims to find the extent to which the use of human resources information systems affects the functions of human resources management and aids staff performance, effectiveness and their job-related activities and duties. . The survey uses a fixed-response format so that you will be able to complete it easily and quickly (less than 20 minutes). Please keep in mind that there is no right or wrong answer; we simply seek your opinions based on your knowledge and experience of practice in your university.

As a participant in this survey you face no risks. Your name and identity will not be collected, so your responses cannot be associated with you. Please be assured that data collected in this research will be solely used for academic purposes. You may also withdraw from this study at any time without having to give an explanation. Once you signed this consent form, you agree to take part in the research and that you understand the terms of this study. Should you require additional information or have any questions, kindly ask or contact me (the researcher) at the details listed below.

**Sincerely,**

**Researcher name:** Rashid G Aletaibi

**Email:** aletaibr@uni.coventry.ac.uk

**Supervisor name:** Professor Jim Stewart

**Email:** J.stewart@coventry.ac.uk

Researcher signature:

**Participant Information**

**Respondent Name:**

**Signature:**

**Date:**



## Section 1 : Background questions

Please answer the following questions about yourself. (Please tick ☒ the appropriate box)

### 1. Please indicate your age range?

- ☐ 18 to 24 years      ☐ 25 to 34 years      ☐ 35 to 44 years  
☐ 45 to 54 years      ☐ Age 55 or older

### 2. Please indicate the highest level of education you have completed?

- ☐ Some high school      ☐ College  
☐ Bachelor's degree      ☐ Master's degree  
☐ Doctoral degree      ☐ other please specify.....

### 3. How would you rate your computer skill level?

- ☐ Never used      ☐ Beginner      ☐ Intermediate  
☐ Advance      ☐ Expert

### 4. How often do you use computers?

- ☐ Never      ☐ Daily      ☐ Weekly      ☐ Monthly

### 5. Please indicate your experience of using the internet ?

- ☐ Less than 1 year      ☐ from 1 to less than 3 years  
☐ From 3 to less than 5 years      ☐ from 5 years to less than 7 years  
☐ 7 years or more

### Information guideline:

- ❖ Please read each of the statement before and tick 1 if you strongly Disagree, 2 if you disagree, 3 if you neutral, 4 if you agree, 5 if you strongly agree.
- ❖ Only tick once per statement.

## Section 2: System Quality

Please assess the system quality of your university's HRIS. You can choose and circle any one of the following between 1 (strongly disagree) and 5 (strongly agree).

No.	Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	HRIS is easy to navigate.	1	2	3	4	5
2.	HRIS allows me to easily find the information I am looking for.	1	2	3	4	5
3.	HRIS is well structured.	1	2	3	4	5
4.	HRIS is easy to use.	1	2	3	4	5
5.	HRIS offers comfortable access to all the business applications I need.	1	2	3	4	5

## Section 3 :Information Quality

Please assess the quality of the information provided by your university's HRIS. You can choose and circle any one of the following between 1 (strongly disagree) and 5 (strongly agree).

No.	Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	The information provided by our HRIS is useful.	1	2	3	4	5
2.	The information provided by our HRIS is understandable.	1	2	3	4	5
3.	The information provided by our HRIS is interesting.	1	2	3	4	5
4.	The information provided by our HRIS is reliable.	1	2	3	4	5
5.	The information provided by our HRIS is complete.	1	2	3	4	5
6.	The information provided by our HRIS is up-to-date.	1	2	3	4	5

## Section 4: Service Quality

Please assess the service quality of the personnel responsible for the support of your university's HRIS. You can choose and circle any one of the following between 1 (strongly disagree) and 5 (strongly agree).

No.	Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
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1.	The responsible service personnel are always highly willing to help whenever I need support with the HRIS	1	2	3	4	5
2.	The responsible service personnel provide personal attention when I experience problems with the HRIS	1	2	3	4	5
3.	The responsible service personnel provide services related to the HRIS at the promised time.	1	2	3	4	5
4.	The responsible service personnel have sufficient knowledge to answer my questions in respect of the HRIS	1	2	3	4	5

### Section 5: Subjective Norm

The following statements relate to social influence that may be relevant (e.g. Family, peers and colleagues) when using HRIS in your daily tasks .You can choose and circle anyone of the following between 1 (strongly disagree) and 5 (strongly agree)

No.	Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	People whose opinions I value would approve of my using HRIS in my daily work routine	1	2	3	4	5
2.	People who are important to me would approve if I used HRIS in my daily work routine.	1	2	3	4	5
3.	People who influence my behavior would think that I should use HRIS to finish my daily work tasks.	1	2	3	4	5
4.	It is expected of me to use HRIS in my daily work routine.	1	2	3	4	5

### Section 6 : User Satisfaction

Please indicate your satisfaction with your university's HRIS. You can choose and circle any one of the following between 1 (strongly disagree) and 5 (strongly agree).

No.	Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	HRIS has met our expectations.	1	2	3	4	5

2.	The employees of HR department appear to be satisfied with our HRIS.	1	2	3	4	5
3.	HRIS could be better utilized.	1	2	3	4	5
4.	Overall I am satisfied with our HRIS.	1	2	3	4	5

### Section 7 : Use of HRIS

Please indicate the extent to which you use HRIS to perform the following tasks. You can choose and circle any one of the following between 1 (strongly disagree) and 5 (strongly agree).

No.	Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	I use HRIS to retrieve information.	1	2	3	4	5
2.	I use HRIS to Publish information.	1	2	3	4	5
3.	I use HRIS to communicate with colleagues.	1	2	3	4	5
4.	I use HRIS to store and share documents.	1	2	3	4	5
5.	I use HRIS to retrieve your colleagues' contact information.	1	2	3	4	5
6.	I use HRIS to retrieve competence profiles.	1	2	3	4	5
7.	I use HRIS to network with colleagues.	1	2	3	4	5
8.	I use HRIS to execute work processes.	1	2	3	4	5

### Section 8 : Adoption usage

Please assess the impact of HRIS adoption in your university's. You can choose and circle any one of the following between 1 (strongly disagree) and 5 (strongly agree).

No.	Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
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1.	HRIS has helped my University improve the efficiency of internal operations	1	2	3	4	5
2.	HRIS has helped my University improve the quality of working results	1	2	3	4	5
3.	HRIS has helped my University enhance and improve coordination within the University.	1	2	3	4	5
4.	HRIS has helped my University enhance and improve collaboration within the University	1	2	3	4	5
5.	HRIS has helped distinguish my University from similar University	1	2	3	4	5
6.	HRIS has helped my University make itself an overall success.	1	2	3	4	5

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**Any additional comments:**

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